COLLEGE CALENDAR.

Session 1900-1901.

Session begins Wednesday, September 12, 1900.
Second Quarter begins Monday, November 19, 1900.
Thanksgiving Day, Thursday, November 29, 1900.
Christmas Vacation, one week.
Second Term (Third Quarter), begins Monday, Jan. 28, 1901.
Washington's Birthday, Friday, February 22, 1901.
Fourth Quarter begins Friday, April 5, 1901.
Session ends, Commencement, June 7-9, 1901.

OFFICIAL TITLE:—

THE CLEMSON AGRICULTURAL COLLEGE
OF SOUTH CAROLINA.

Postoffice and Telegraph Office: CLEMSON COLLEGE, S. C.
Freight and Express Office: CALHOUN (Southern R'y), S. C.

COMMENCEMENT, 1900.

Programme.

FRIDAY, JUNE 8th.
11.00 A. M.—Address to Graduating Class,
            President Geo. T. Winston, L L. D.
8.30 P. M.—Alumni Address, R. McLendon.

SATURDAY, JUNE 9th.
11.00 A. M.—Commencement Exercises and Delivery of Diplomas.
8.30 P. M.—Glee Club Entertainment.

SUNDAY, JUNE 10th.
11.00 A. M.—Baccalaureate Sermon, Bishop Ellison Capers.
8.30 P. M.—Farewell Exercises, Y. M. C. A.
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BOARD OF TRUSTEES.

Life Members.

Name. Country.
HON. R. W. SIMPSON, President ...................... Anderson
SENATOR B. R. TILLMAN .............................. Edgefield
HON. R. E. BOWEN .................................. Pickens
HON. D. K. NORRIS ................................. Anderson
HON. J. E. BRADLEY ................................ Abbeville
HON. M. L. DONALDSON ............................ Greenville
HON. J. E. WANNAMAKER .............................. Orangeburg

Term Expires 1904.

HON. J. E. TINDAL .................................. Clarendon
HON. D. T. REDFEARN ............................. Chesterfield
HON. JESSE H. HARDIN .............................. Chester

Term Expires 1902.

HON. W. H. MAULDIN ............................... Hampton
HON. H. M. STACKHOUSE ............................ Marlboro
HON. A. T. SMYTHE ................................. Charleston

P. H. E. SLOAN, Secretary and Treasurer, Clemson College, S. C.

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R. E. BOWEN, J. E. BRADLEY.

FINANCE COMMITTEE.

R. W. SIMPSON, W. H. MAULDIN, M. L. DONALDSON.
BOARD OF VISITORS 1899-1900.

First District.......... HON. W. H. THOMAS, Charleston
Second District....... HON. HARRY HAMMOND, Aiken
Third District........ HON. GEO. S. MOWER, Newberry
Fourth District........ HON. JAS. T. WILLIAMS, Greenville
Fifth District........ HON. W. F. STEVENSON, Chesterfield
Sixth District......... HON. W. C. COKER, Darlington
Seventh District....... HON. R. I. MANNING, Sumter
FACULTY.

(In order of appointment, except the President.)

HENRY S. HARTZOG, LL. D.,
President.

M. B. HARDIN (Virginia Military Institute),
Professor of Chemistry.

C. M. FURMAN (A. B., Furman University),
Professor of English.

W. S. MORRISON (A. B., Wofford College),
Professor of History.

J. V. LEWIS (B. E., University of N. C.; S. B., Harvard; Johns Hopkins),
Professor of Geology.

J. S. NEWMAN (University of Virginia),
Professor of Agriculture.

WILLIAM H. BOEHM (B. S., Rose Polytechnic Institute; M. M. E., Cornell),
Professor of Mechanical and Electrical Engineering.

G. SHANKLIN (South Carolina Military Academy),
Acting Professor of Military Science and Tactics.

J. H. M. BEATY (South Carolina College),
Professor of Textile Industry.

P. T. BROADIE (B. S., A. B., Furman University),
Professor of Mathematics.

R. N. BRACKETT (A. B., Davidson College; Ph. D., Johns Hopkins),
Assistant Professor of Chemistry.

A. M. REDFEARN (Furman University; B. S., Wake Forest College.
M. D., L. I. College Hospital),
Instructor in Physiology.

F. S. SHIVER (Ph. G., University of South Carolina),
Instructor in Agricultural Analysis.

ALBERT BARNES (Univ. State of New York; M. E., M. M. E., Cornell),
Instructor in Woodwork.

J. S. McLUCAS (A. B., South Carolina College; A. B., A. M., Harvard),
Assistant Professor of English.
W. M. RIGGS (B. S., E. and M. E., Alabama Polytech. Inst.),
Instructor in Electricity.
(And in Charge of Electrical Laboratories.)

C. M. CONNER (B. Agr., Univ. of Missouri; B. S., Mich. Agr. College),
Assistant Professor of Agriculture.

T. G. POATS (Miller School, Virginia; University of Virginia),
Instructor in Physics.

CHARLES HANCOCK (Miller School, Virginia; University of Virginia),
Instructor in Drawing.

G. E. NESOM (B. Sc., Mississippi Agricultural and Mechanical College;
D. V. M., Iowa State Veterinary College),
Instructor in Veterinary Science.

F. D. FRISSELL (Philadelphia Textile School),
Instructor in Weaving and Designing.

WILLS JOHNSON (Miller School, Virginia),
Instructor in Forge and Foundry.

P. H. ROLFS (M. Sc., Iowa State College),
Instructor in Botany.

J. G. SIMPSON (B. S., Clemson College),
Instructor in Machine Shop.

C. B. WALLER (A. M., Wofford College; Vanderbilt University),
Assistant Professor of Mathematics.

A. P. ANDERSON (M. S., Univ. of Minnesota; Ph. D., Univ. of Munich),
Instructor in Entomology.

D. WISTAR DANIEL (A. B., Wofford College),
Assistant Professor of English.

C. C. NEWMAN (Clemson College),
Instructor in Horticulture.

W. W. KLUGH (B. S., Clemson College),
Assistant Instructor in Woodwork.

R. E. LEE (B. S., Clemson College),
Assistant Instructor in Drawing.

SAMUEL MANER MARTIN (S. C. Military Academy),
Instructor.

S. E. LILES (B. S., Clemson College),
Assistant Instructor in Forge and Foundry.
BOARD OF HEALTH.

HENRY S. HARTZOG, President.
DR. A. M. REDFEARN, Surgeon.
DR. P. H. E. SLOAN, PROF. M. B. HARDIN,
PROF. J. S. NEWMAN.
Whereas, It has pleased God to remove by death our venerable colleague, Prof J. F. C. DuPre,

Be it resolved, That we heartily deplore the death of our deceased friend.

That we extend to the members of his family the assurance of our earnest sympathy with them in their great affliction.

Resolved further, That a copy of these resolutions be sent to the family of our lamented associate; that they be inserted in the daily papers of the State, and that a page of our minute-book be inscribed to his memory.
GENERAL INFORMATION.

Origin and Objects.

In 1886 a convention of the farmers of South Carolina passed a resolution advocating the establishment of an Agricultural College. The matter was given definite form by the action of the Hon. Thomas G. Clemson, son-in-law of John C. Calhoun, who died in 1888, leaving as a bequest to the State the old Calhoun homestead, Fort Hill, consisting of about 800 acres of land, and about $80,000 in other securities, for the purpose of establishing an Agricultural College.

The Legislature passed an act which became a law in November, 1889, accepting the bequest. The College opened July 6, 1893, with an enrollment during its first session of 446 students.

The object of the College, in conformity with the Acts of Congress and of the State Legislature, is to give practical instruction in agriculture and in the mechanic arts. To accomplish this object in its highest sense, careful instruction is given in the principles and applications of the sciences bearing upon agriculture and mechanics; and to give the breadth and culture necessary for a rounded education, courses are provided in history, economics and English.

It is considered of the utmost importance that students be taught, not only theoretical methods, but practical work in these methods. To this end, as much time is devoted to laboratory, and shop-work, field-instruction, and other practical exercises, as to lectures and recitations.

Location.

The College is located on the dividing line between Oconee and Pickens counties, in the picturesque foot-hills of the Blue Ridge. It has an elevation of about 900 feet above sea-level, and commands an excellent view of the mountains to the north and west, some of which attain an altitude of nearly 5,000 feet. The climate is invigorating and healthful and the surroundings are in every way favorable to the highest physical and mental development. The buildings are located on the old Fort Hill homestead of John C. Calhoun.

The College is one mile from Calhoun, a station on the main line of the Southern Railway, and two miles from Cherry's, on the Blue
Ridge Railroad. By means of these roads and their connections, the College is easily accessible from all parts of the State. It is also connected by telephone with Calhoun and Pendleton, and thence by telegraph with all parts of the country. The postoffice is conveniently situated on the campus, and receives five daily mails.

College Grounds and Buildings.

GROUNDs.—The College grounds occupy about two hundred acres of land, including the campus, sites of buildings and residences, and grounds for military drill and outdoor athletics. The campus is laid out in walks, drives and lawns, and is shaded by a beautiful grove of native forest trees.

In memory of the lamented R. T. V. Bowman, late instructor in forge and foundry work, the new athletic and parade grounds have been named “Bowman Field.”

The principal buildings of the College are heated by steam, lighted by electricity, and supplied with water connections for laboratory use and for protection against fire.

AGRICULTURAL HALL is a three-story brick structure, 130 x 140 feet, trimmed with gray sandstone. It contains twenty-two rooms, including recitation-rooms, library and reading room, literary society halls, laboratories for botany, entomology, physics and mineralogy, besides the offices of the President, the Commandant and the Secretary and Treasurer. Adjoining this building is Memorial Hall, the College chapel, which has a seating capacity of 1,000. It is used for religious services and as an assembly-room.

THE MECHANICAL BUILDING is a substantial brick structure of liberal dimensions, containing about 30,000 square feet of floor space. On the first floor are the mechanical laboratory, machine-shop, forge-shop, foundry, and the power and light station. On the second floor are the offices and recitation-room, while the wood-shop occupies the whole of a two-story wing 45 x 100 feet. The third floor is entirely occupied by the division of drawing.

THE CHEMICAL LABORATORY is a two-story brick building, fifty by eighty feet, covered with slate, and finished inside with Southern pine. On the first floor there are eight rooms. Five of these are appropriated for State Analytical and Experiment Station work, one is a balance-room for students, one an office, and one is fitted up as a laboratory for advanced students. The basement is used for assaying and for storage. On the second floor there are five rooms: qualitative laboratory, 36 x 48 feet, with a pitch of seventeen feet in the clear, lecture-room, professor’s laboratory, an office, and a room for gas analysis.
An addition to the Chemical Laboratory, about the size of the present building, is now in process of erection.

THE TEXTILE BUILDING is a two-story brick structure of modern cotton-mill design, protected from fire by automatic sprinklers and a 10,000-gallon water-tank in the tower. The first floor is occupied by recitation-rooms, carding and spinning rooms, and office. On the second floor are the dyeing and weaving departments.

The capacity of this building will be doubled during the present year.

THE CADET BARRACKS is a three-story brick building containing 148 rooms for students, a dining-hall 134x44 feet, and a kitchen 50x37 feet. The building is heated by steam and lighted by electricity, and has an abundant supply of pure spring-water.

The rooms in barracks are furnished with single-width iron cots, mattresses, tables, chairs, wardrobes, buckets, pans, cups and mirrors. The dining-hall is well supplied with table-linen, silverware and china. The kitchen is equipped with modern appliances for culinary purposes.

The bathrooms and closets are located in brick buildings apart from the barracks, and connected with it by covered gangways.

THE ELECTRICAL INSTRUMENT LABORATORY is a brick building of special design, containing no magnetic material in its permanent construction. Besides a laboratory for delicate instruments, it also contains a lecture-room and a dark room for photometry and X-ray work.

A substantial brick building, 37x80 feet, especially designed for dynamo-electric machinery, will be ready for use as an additional laboratory at the beginning of the coming session. It will contain the electrical machinery formerly installed in the Mechanical Building.

THE HORTICULTURAL BUILDING, a two-story frame structure, contains the offices, class-rooms and collections of the horticultural division, and the local office of the United States Weather Bureau. There are also a spacious, well-equipped greenhouse, a canning-house, and a packing-house with brick basement.

THE DAIRY BUILDING is a wooden structure of modern design, constructed especially to illustrate the most approved methods of dairy practice.

THE VETERINARY HOSPITAL is a commodious two-story frame building, 30x48 feet, with a basement 18x30 feet. It contains a dissecting-room, drug-room, an office, feed rooms, and apartments for an attendant.
THE HOSPITAL, located more than a quarter of a mile from the barracks, is a wooden building especially designed for the purpose. It is lighted by electricity and has a thorough sewerage system. The hospital is in the immediate charge of the College Surgeon, who is assisted by an experienced matron and a nurse, thus ensuring the best personal attention to each patient.

THE CALHOUN MANSION, the former residence of John C. Calhoun, is kept in honor of his memory, in accordance with the provisions of Mr. Clemson's will.

RESIDENCES.—Nine two-story brick buildings, nine six-room cottages, and sixteen smaller houses furnish residences for professors and other officers of the College. Those members of the faculty who do not occupy residences are furnished lodgings at the College Hotel, a beautifully located building overlooking the campus.

THE LAUNDRY is a brick building specially constructed and fitted with the improved machinery of a modern steam laundry. It is operated exclusively for students.

EXPERIMENT STATION OFFICES.—A wooden building containing offices, a library, and storage and seed rooms, is provided for the use of officers of the Experiment Station.

FARM BUILDINGS.—The College is provided with commodious barns and other farm buildings of modern design, which are described more fully in connection with the equipment for instruction in agriculture.

THE POULTRY YARDS are supplied with incubators, brooders, and other modern appliances. There are thirty-six pens 20x32 feet, each containing a house 6x8 feet. For every four pens there is a run 80x150 feet, all enclosed with poultry cabled wire.

Water Supply.

There are two sources from which water is obtained. The general supply is collected from springs through iron pipes into a reservoir, from which it is pumped into a stand-pipe eighty feet high, whence it is distributed.

Drinking water is pumped from a bold spring, in a continuous stream, directly into the barracks. It is by this means furnished fresh, pure, and cold.

The waste water is used for flushing the sewer-pipes, which empty into the Seneca river a half-mile away.

Tuition.

The following extract is taken from Section 1120, Revised Statutes of South Carolina, 1893, Volume I, setting forth the pow-
ers and duties of the Board of Trustees: "They shall charge each student a tuition fee of forty dollars per annum; *** indigent students shall not be required to pay said tuition fee."

In accordance with this law, residents of South Carolina are granted free tuition upon presentation of the following certificate properly signed:

**CERTIFICATE OF INABILITY TO PAY TUITION.**

This is to Certify, That I am unable to pay tuition for my____________________ in the Clemson Agricultural College for the session of 1900-1901.

Father or Guardian.

I hereby certify that, to the best of my knowledge and belief the above statement is true.

County Auditor.

All other students pay the tuition fee of $40.00 per session. Blank certificates will be furnished upon application to the President.

**Expenses for the Session of 1900-1901.**

For Free-tuition Students, .............. $100 42
For Tuition-paying Students, ............. 140 42

These charges are due and payable in advance on the first day of each quarter, as follows:

September 12, 1900, or on day of entrance:
- Incidental Fee, .............. $ 5 00
- Medical Fee, .............. 5 00
- Uniform .............. 22 92
- Board and washing, first quarter, .. 16 88

Total for Free-tuition Students, .... $49 80
Tuition, first quarter, .............. $10 00

Total for Tuition-paying Students, .... 59 80
November 19, 1900:
  Board and washing, second quarter, $16 88

  Total for Free-tuition students, . . . . . 16 88
  Tuition, second quarter, . . . . . . . $10 00

  Total for Tuition-paying Students, . . . 26 88

January 28, 1901:
  For Free-tuition Students, third quarter, . . 16 88
  For Tuition-paying Students, . . . . . . . 26 88

April 5, 1901:
  For Free-tuition Students, fourth quarter, . . 16 88
  For Tuition-paying Students, . . . . . . . 26 88

In addition to the above charges a deposit of $2.00 is required of all students upon entrance, according to the following resolution of the Board of Trustees:

Resolved, That at the beginning of a session each student be required to deposit $2.00 with the Treasurer, to be known as a breakage fee. Whenever the property of the College is damaged, the actual cost of the repair of the property damaged shall be charged to the student who damaged the property. If, however, the responsibility can not be fastened upon any student, the amount of the damage shall be prorated equally among all the students. At the end of the session any amount to the credit of a student shall be returned to him.

The price of uniforms is subject to fluctuations of the market.

To the above must be added the cost of books and stationery, which may be obtained at the Cadet Exchange at wholesale prices; also $1.50 for diploma, payable on graduation.

Remittances should be made in cash, money-order, or New York Exchange, not by local checks, to P. H. E. SLOAN, Treasurer, Clemson College, S. C.

A deduction will be made for board and washing only when a student is absent one month or more.

Uniform.

The College uniform is of cadet gray of the West Point pattern, except that the College button is used. For military full dress, the cadet officers wear a plume and sash, and the non-commissioned officers and privates a pompon. This uniform is made of the best Charlottesville mills goods, is neat, and, considering the make and material, is very inexpensive.
Requirements for Admission.

Each candidate for admission must be at least fifteen years of age, except where two brothers apply, one being over fifteen and the other not under fourteen.

Certificates of good moral character are required of all candidates for admission not known to members of the faculty; and, if the candidate comes from another college, this certificate must show that he was honorably discharged.

For admission into the Freshman class thorough proficiency is required in arithmetic, in algebra through quadratics, English grammar, geography, and history of the United States. The textbooks recommended to those preparing to enter the Freshman class are Wells’ Academic Arithmetic, Wentworth’s Algebra, Whitney-Lockwood’s English Grammar, Redway and Hinman’s Natural Advanced Geography, Eggleston’s History of the United States and Its People.

All candidates for matriculation are subject to a medical examination, and will be excluded from the College on account of consumption or other contagious or communicable diseases, or permanent disability for manual labor or military duty.

Reports.

Monthly reports are furnished to parents and guardians, giving the standing of students in all studies and in discipline. Reports are also issued at the end of each term, showing the grades, based upon class-work and examinations, in all studies. Parents will be advised to withdraw students who habitually shirk duties.

Regulations.

In addition to the special regulations of the military department, cadets are subject to the following general regulations:

Matriculation is equivalent to a pledge to conform to the rules and regulations of the College.

Cadets are subject to military discipline at all times, and are required to take part in drill, guard duty, and other military exercises.

All students are required to pursue regular courses, except when granted special permission by the faculty to take irregular courses.

Students in any class who fail to pass on more than one subject will not be promoted, and no student will be promoted to the Freshman class or to the Senior class until all deficiencies are made up.
Students are required to make up all class-work from which they have been absent for any cause except military duty.

All regular students are required to board in the barracks, except those who live with their parents near enough to attend from their homes.

Each student is required to purchase the prescribed uniform; also a pair of over-shoes and a rubber coat. Students may provide themselves with such work-clothes as they desire.

Each student will be required to bring with him four sheets, two blankets, a comfort, six towels, one pillow and two pillow-cases. Beds are single width.

Not more than three students are permitted to occupy the same room. Those occupying a room are consulted before another student is assigned to that room. A student not satisfied with his room-mates has the privilege of applying for permission to move to another room, and such applications are granted when practicable.

All students are required to purchase the text-books used in their classes, unless excused for special reasons by the instructors. Text-books are kept at the Cadet Exchange and are furnished to students at wholesale prices.

Cadets will at all times be respectful in their bearing to professors and other officers of the College.

The practice known as hazing is positively forbidden, and any cadet indulging in this practice will be expelled from the College.

Cadets are positively forbidden to use or to have in their possession intoxicating liquors of any description.

The use of tobacco in any form by cadets is prohibited.

Profanity is positively forbidden.

Cards and all games of chance are positively forbidden.

All combinations of cadets for the purpose of censuring or praising one of their number are prohibited; also, all combinations to defeat the purpose of any regulation of the College.

Rules Presented by the Trustees for the Appointment of Students.

The indications are that there will not be room next September for all who apply.

In determining which students shall be notified to report to the College, the following rules prescribed by the Board of Trustees will govern:

1. Students must undergo a medical examination, and no student will be admitted who is not healthy and free from contagious diseases, including consumption.
2. Students will be apportioned among counties in proportion to representation in the House of Representatives, under the following rules and regulations:

(a) Boys prepared to enter College classes will have preference over those who can only enter preparatory classes.

(b) As between boys of equal preparation, the oldest will have the preference.

(c) Other things being equal, the first applicants will receive permission to enter.

(d) When a county has not sent its quota, the places thus left shall be apportioned among the other applicants.

(e) Applicants not entering within ten days after the opening of the session will have their rights in the place given to applicants next on the roll.

Fighting is positively forbidden. If any cadet shall consider himself wronged by another or by a professor or by an officer, he is to complain thereof in writing to the President, who will examine into the complaint and take such measures for redressing the wrong as he may deem proper.

Cadets are forbidden to keep any arms in their possession not issued by the proper authority.

Any cadet receiving 100 demerits during a term of five months will be dismissed.

Any cadet absent from barracks at night without proper authority will be dismissed.

**College Organization.**

The College is organized into six departments, as follows:

1. Agricultural Department.
2. Mechanical Department.
3. Department of Chemistry and Natural Science.
4. Academic Department.
5. Textile Department.
6. Military Department.

Each department is presided over by a professor designated by the Board of Trustees as Head of Department, who, in addition to teaching, exercises general supervision over the work of the department. The divisions of each department are in the immediate charge of special instructors.

**THE AGRICULTURAL DEPARTMENT** comprises the following divisions: General Agriculture, including Animal Husbandry; Horticulture; Entomology; Botany; Dairying, Veterinary Science; Poultry Raising.
THE MECHANICAL DEPARTMENT comprises the divisions of Applied Mechanics, including Experimental Engineering; Physics; Electrical Engineering; Drawing and Designing; Forge and Foundry; Machine-Shop; Woodwork.

THE DEPARTMENT OF CHEMISTRY AND NATURAL SCIENCE includes Chemistry, general, industrial, agricultural and analytical; Geology and Mineralogy.

THE ACADEMIC DEPARTMENT comprises the courses in Mathematics, English, History, and the Subfreshman Division.

THE TEXTILE DEPARTMENT comprises the courses in Textile Industry.

THE MILITARY DEPARTMENT comprises theoretical and practical instruction in Military Science and Tactics.

Experiment Station.

The State Experiment Station occupies a portion of the College farm, and affords valuable opportunities for instruction in the various divisions of the Agricultural department.

Under the guidance of the Station officers, the students are expected to familiarize themselves with the different lines of investigation being carried on, and thus to have their interest in agricultural topics awakened, their powers of observation strengthened, and to learn to tabulate and compare results of experiments conducted and to draw conclusions therefrom. The organization and work of the Experiment Station are described at the end of this catalogue.

Farmers' Institutes.

During the past year farmers' institutes were held, under the management of the College, in many counties of the State. The President and Professors of Agriculture, Chemistry, Horticulture, Dairying, Veterinary Science, Botany and other members of the faculty have taken part in these institutes. The purpose has been to bring practical information to the farmer, and to give him the results of scientific investigation in the interest of Agriculture. The success thus far attained is most encouraging, and leads to the hope that these institutes may become a permanent feature in the work of the College.

They will be continued during the coming vacation. A special institute of ten days' duration will also be held at the College during the month of August, in which, besides the College faculty, a number of prominent speakers from other States are expected to participate.
Farmers wishing an institute held in their county or community should write to the President.

**Nature Study.**

Arrangements are being made to issue in the near future a series of leaflets on Nature Study. These will be prepared specially for the use of teachers, and will be distributed free of charge for the purpose of encouraging and aiding in the introduction of Nature Study into the public schools of the State.

**Student Labor.**

Considerable manual labor is necessary to carry on the Agricultural and Mechanical departments of the College. Students who desire it are employed in this work, when practicable, and are paid for it at the rate of eight cents an hour; but no student is allowed to undertake work that interferes with his College course. Some needy students are thus enabled to pay part of their College expenses. The demand for such labor always exceeds the supply, and the College assumes no obligation to furnish employment for wages. Students entering late are at a special disadvantage in securing this work.

**Religious Influences.**

Every effort is made to surround the students with safe religious influences. There is preaching in Memorial Hall every Sunday morning by ministers of the different denominations, and chapel services are conducted every morning by the President and other members of the faculty. All students are required to attend these exercises unless specially excused. A Sunday School, at which attendance is voluntary, also meets every Sunday morning, and students are encouraged and urged to attend.

**Young Men's Christian Association.**

This is a voluntary organization of the students, and is entirely under their management. The objects of the Association are to promote Christian fellowship among its members and aggressive Christian work among the students. The meetings are held in Memorial Hall every Sunday evening. The membership is of two classes—active and associate. A member in good standing of any evangelical church may become an active member of the Association, and any young man of good moral character may become an associate member. The faculty are in hearty sympathy with the
work of the Association, and render cheerful service when requested to do so. Parents and guardians are advised to encourage the students to join the Association as soon as they reach the College.

**Care of the Sick.**

The College Surgeon will keep parents fully informed of the condition of sick students. In case of serious illness parents are notified by telegraph.

Students have permission to call on the Surgeon at any time for advice and treatment. The Surgeon can not undertake to notify parents every time a student reports to the hospital for medicine or rest on account of some slight complaint; but parents may rest assured that they will hear from the Surgeon promptly in case of sickness of any consequence.

The health record for the past year has been exceptionally good, and many sanitary improvements have been made to insure the continued health of the students.

The College rules require that all students be vaccinated, and parents are advised to have this done before sending their sons away from home.

**Library.**

In the Agricultural building are a series of rooms specially constructed for the use of the Library. About 4,600 volumes of standard English literature, history, biography, general science, etc., and about 1,000 volumes of government publications are now on the shelves. The number of books is being added to each year. They have been recently classified and arranged, and excellent opportunity is now offered students for general and supplementary reading.

In recent purchases for the library special efforts have been made to procure all available books on South Carolina history and literature.

**Reading Room.**

Connected with the Library is the students' reading-room, supplied with the leading magazines and daily papers, and most of the county papers of the State.

**Literary Societies.**

Three literary societies, the Calhoun, the Palmetto and the Columbian, furnish a valuable supplement to the work of the College. These societies afford facilities for practice in debate, oratory, declamation and essay-writing, and their members acquire valuable
knowledge of parliamentary law and usage. The meetings are held weekly on Friday evenings. Public celebrations and contests are also held at intervals during the year, at which there are debates, orations and declamations by the students.

The societies occupy halls in the main College building, which are furnished with carpets and opera-chairs, and are maintained entirely by the students. A small fee is charged for initiation, and there are also monthly dues of a few cents to meet running expenses. The total membership usually comprises about nine-tenths of the registered attendance at the College. All students are advised to join one of these societies.

THE CLEMSON COLLEGE CHRONICLE, a magazine designed to encourage literary work among the students, is published monthly during the session by the literary societies.

Scientific Association.

A Scientific Association has been organized for the purpose of promoting knowledge of the progress of the natural sciences, theoretical and applied. Public meetings are held every two months, at which subjects of general scientific interest are discussed by members of the faculty and advanced students of the College. These meetings are largely attended by the students.

Lecture Course.

A lecture course, employing some of the best talent on the American platform, has been provided for the coming session. These lectures will be delivered in Memorial Hall, and will occur monthly while the course is in progress. The cost to students will be about $1.00 for six lectures.

Cadet Exchange.

A Cadet Exchange is maintained, where students may purchase at wholesale prices necessary articles, such as books, stationery, collars, cuffs, underwear, etc.

Athletics.

It is the policy of the College to sanction and encourage manly athletics so long as studies and other duties are not interfered with. Class records show that, as a rule, students engaged in athletics do as well in their classes as those who are not. Should future experience reverse these records athletic sports will be restricted or prohibited altogether.
The following resolution relative to athletics has been passed by the faculty: That it is the sense of the faculty that only cadets in good class standing be permitted to play in any intercollegiate game of tennis or of ball—either base or football—to appear in any public exhibition or on the rostrum; or to attend as Clemson's representatives any meeting of any sort at any time or place.

The most popular games this year are baseball and football. It is assumed that parents are willing for their sons to participate in these games unless the President is definitely notified to the contrary. The athletic teams will be permitted to take a few trips each season, usually on Saturdays to play intercollegiate games. Students must file written permission from parents for these trips.

**Medals.**

**PRESIDENT'S ESSAY MEDAL.**—A gold medal is offered annually by the President for the best essay. The subject is announced early in the year and the competition is open to all students. In 1900 this medal was awarded to Mr. R. N. Reeves; subject, "Good Roads."

*R. W. SIMPSON MEDAL.*—A gold medal is awarded annually by Messrs. Oehm & Co. to the best drilled cadet in the Freshman, Sophomore and Junior classes. This medal was awarded in 1900 to Mr. W. P. Hyams.

A **GOLD MEDAL** is also awarded annually to the captain of the best drilled company. Awarded in 1900 to Capt. S. D. Pearnman of Company F.

**SOCIETY MEDALS.**—The literary societies award medals for excellence in debate, oratory and declamation.

**The Clemson Pictures.**

Following is a list of the oil-paintings bequeathed by Thomas G. Clemson. This collection, with additional portraits, may be seen in the President's office in the Agricultural building:

1. Virgin and Child ........................................... Rubens.
2. Head of Velasquez .......................................... Poussin.
3. Landscape ................................................. Zegers.
4. Flower Piece ............................................... Teniers.
5. The Jesuit with Medallion .................................. Deheem.
6. Fruit, etc. .................................................... Vansomer.
7. Student's Repast ........................................... Frans Hals.
8. Peasant Eating Soup ....................................... Frans Hals.
9. Adoration (on copper) ..................................... Spanish.
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Artist or Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Landscape</td>
<td>Louis Robert</td>
</tr>
<tr>
<td>16</td>
<td>Magdalen</td>
<td>Van Schendel</td>
</tr>
<tr>
<td>17</td>
<td>Landscape</td>
<td>Fearnley</td>
</tr>
<tr>
<td>18</td>
<td>Gateway</td>
<td>Tavernier</td>
</tr>
<tr>
<td>19</td>
<td>Titian Placing his Model</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>The Quarrel</td>
<td>Venneman</td>
</tr>
<tr>
<td>21</td>
<td>Reconciliation</td>
<td>Venneman</td>
</tr>
<tr>
<td>22</td>
<td>Two Old Men</td>
<td>Venneman</td>
</tr>
<tr>
<td>23</td>
<td>Scene in Spain</td>
<td>Bossnet</td>
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<tr>
<td>24</td>
<td>Marine View in Holland</td>
<td>Francia</td>
</tr>
<tr>
<td>25</td>
<td>Poverty and Suffering</td>
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<tr>
<td>26</td>
<td>Group of Lambs</td>
<td>Louis Robert</td>
</tr>
<tr>
<td>27</td>
<td>Tasso in Prison Visited by Montaigne</td>
<td>Copy after Gallait</td>
</tr>
<tr>
<td>28</td>
<td>Magdalen, Study after Murillo</td>
<td>DeBlock</td>
</tr>
<tr>
<td>29</td>
<td>Girl of Antwerp with two Dogs</td>
<td>Copy after Landseer</td>
</tr>
<tr>
<td></td>
<td>(Original in the gallery of King Leopold of Belgium.)</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Landscape</td>
<td>Copy of Koekkoek by Louis Robert</td>
</tr>
<tr>
<td>31</td>
<td>Waterfall</td>
<td>Copy of Auerbach by L. Robert</td>
</tr>
<tr>
<td>32</td>
<td>Peasant Girl</td>
<td>By an Antwerp Artist</td>
</tr>
<tr>
<td>33</td>
<td>Gate of the Alhambra</td>
<td>Copy of Bossnet</td>
</tr>
<tr>
<td>34</td>
<td>Beatrice Cenci</td>
<td>Very old copy; done before original had faded.</td>
</tr>
<tr>
<td>35</td>
<td>Mother Teaching Son</td>
<td>Copy</td>
</tr>
<tr>
<td>36</td>
<td>Landscape</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Old Man Smoking</td>
<td>Leys (Copy)</td>
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</table>
COURSES OF STUDY.

There are three full courses of study—Agricultural, Mechanical and Textile. All regular students in the Freshman class pursue the same studies. The Mechanical and Textile courses are also the same in the Sophomore year. Students pursuing the Mechanical course choose between electrical engineering and civil engineering in the Junior and Senior years.

Upon the completion of one of these courses the student is awarded a diploma conferring the degree of Bachelor of Science (B. S.).

Graduates of the Mechanical course, or of equivalent courses in other institutions, may complete the Textile course in one year.
# AGRICULTURAL COURSE.

## Freshman Class.

<table>
<thead>
<tr>
<th>Theoretical</th>
<th>Hours per week</th>
<th>Practical</th>
<th>Hours per week</th>
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<td>5</td>
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<tr>
<td>English</td>
<td>4</td>
<td>Mechanical Drawing</td>
<td>3</td>
</tr>
<tr>
<td>Composition and Spelling</td>
<td>1</td>
<td>Freehand Drawing</td>
<td>4</td>
</tr>
<tr>
<td>History</td>
<td>3</td>
<td>Forgework</td>
<td>3</td>
</tr>
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<td>Drill</td>
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<td>Chemistry</td>
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<tr>
<td>Stock Breeding</td>
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<td>Horticulture</td>
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</tr>
<tr>
<td>Botany</td>
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<tr>
<td>Agriculture</td>
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## Sophomore Class.

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<tr>
<td>Stock Breeding</td>
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<td>Entomology</td>
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<tr>
<td>Botany</td>
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<tr>
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## Junior Class.

<table>
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<tr>
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<td>Dairying</td>
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## Senior Class.

<table>
<thead>
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<tbody>
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<tr>
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<td>Geology</td>
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### MECHANICAL COURSE.

#### Freshman Class.

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<tr>
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<td>5</td>
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<td>English</td>
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<td>4</td>
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<tr>
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<td>1</td>
<td>Freehand Drawing</td>
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<td>History</td>
<td>3</td>
<td>3</td>
<td>Forgework</td>
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<tr>
<td></td>
<td>Agriculture</td>
<td>2</td>
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<td>Drill</td>
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#### Sophomore Class.

<table>
<thead>
<tr>
<th>Term</th>
<th>Theoretical</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mathematics</td>
<td>5</td>
<td>5</td>
<td>Woodwork</td>
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<td></td>
<td>English</td>
<td>3</td>
<td>3</td>
<td>Mechanical Drawing</td>
</tr>
<tr>
<td></td>
<td>Chemistry</td>
<td>3</td>
<td>3</td>
<td>Foundry</td>
</tr>
<tr>
<td></td>
<td>Natural Philosophy</td>
<td>2</td>
<td>2</td>
<td>Chemical Laboratory</td>
</tr>
<tr>
<td></td>
<td>History</td>
<td>2</td>
<td>2</td>
<td>Descriptive Geometry</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Drill</td>
</tr>
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</table>

#### Junior Class.

<table>
<thead>
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<th>Term</th>
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<th></th>
<th>Practical</th>
<th></th>
</tr>
</thead>
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<tr>
<td></td>
<td>Electrical Eng. or Civil Engineering</td>
<td>3</td>
<td>3</td>
<td>Electrical Lab’ry or Civil Engineering Field Work</td>
</tr>
<tr>
<td></td>
<td>Mechanics</td>
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<td>2</td>
<td>Physical Laboratory</td>
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<tr>
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<td>English</td>
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<td>2</td>
<td>Drill</td>
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<tr>
<td></td>
<td>Military Science</td>
<td>1</td>
<td>1</td>
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<tr>
<td></td>
<td>Mechanism</td>
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#### Senior Class.

<table>
<thead>
<tr>
<th>Term</th>
<th>Theoretical</th>
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</thead>
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<tr>
<td></td>
<td>Mechanical and Steam Engineering</td>
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<td>Shopwork..</td>
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<tr>
<td></td>
<td>Electrical Engineering or Civil Engineering</td>
<td>5</td>
<td>5</td>
<td>Machine or Bridge Design</td>
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<tr>
<td></td>
<td>Applied Mechanics and Hydraulics</td>
<td>3</td>
<td>3</td>
<td>Electrical Laboratory or Civil Eng. Field Work</td>
</tr>
<tr>
<td></td>
<td>History</td>
<td>2</td>
<td>2</td>
<td>Mechanical Laboratory</td>
</tr>
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<td>English</td>
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<td>Drill</td>
</tr>
<tr>
<td></td>
<td>Military Science</td>
<td>1</td>
<td>1</td>
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</table>

*Second term—Chemistry, first half; Surveying second half.*
## TEXTILE COURSE.

### Freshman Class.

<table>
<thead>
<tr>
<th>Theoretical.</th>
<th>Practical.</th>
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<tbody>
<tr>
<td>Mathematics</td>
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<tr>
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<td>Chemical Laboratory</td>
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<td>History</td>
<td>Descriptive Geometry</td>
</tr>
</tbody>
</table>

### Junior Class.

<table>
<thead>
<tr>
<th>Mathematics</th>
<th>Machine Shop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>Textile Industry</td>
</tr>
<tr>
<td>Textile Industry</td>
<td>Drill</td>
</tr>
<tr>
<td>English</td>
<td>Chemical Laboratory</td>
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<tr>
<td>Military Science</td>
<td></td>
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<tr>
<td>Mechanics</td>
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</table>

### Senior Class.

<table>
<thead>
<tr>
<th>Applied Mechanics and Hydraulics</th>
<th>Mechanical Drawing</th>
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</thead>
<tbody>
<tr>
<td>Textile Industry</td>
<td>Textile Industry</td>
</tr>
<tr>
<td>Mechanism</td>
<td>Drill</td>
</tr>
<tr>
<td>Steam Engine</td>
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</tr>
<tr>
<td>English</td>
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<tr>
<td>Military Science</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td></td>
</tr>
</tbody>
</table>

*Second term—Chemistry first half; Surveying second half.*

### Subfreshman Course.

A Subfreshman course is provided for students not prepared to enter the Freshman class. In addition to instruction in the usual preparatory branches, the elements of agriculture, mechanic arts and military drill are also included in this course. The work is closely articulated with the instruction in the advanced classes.
Special Courses.

Graduates of this and other institutions, or other mature young men of earnest purposes, who desire to pursue special lines of work will be given every opportunity that the College affords, upon satisfying the faculty that they are qualified to undertake such courses to advantage. Students thus admitted are expected to apply themselves assiduously, and with the approval of the faculty, may board outside of the barracks.

Irregular Courses.

Students are earnestly advised to pursue regular courses; but those who for satisfactory reasons are unable to do so, may, upon the approval of the faculty, pursue irregular courses. No student whose time is not fully occupied will be permitted to remain at the College. No student who is behind in more than one subject will be permitted to change from a regular to an irregular course. An application for an irregular course must be accompanied by the written approval of parent or guardian, and of instructors in all subjects for which application is made. Diplomas are not issued to irregular students.
INSTRUCTION AND EQUIPMENT.

GENERAL AGRICULTURE.

PROFESSOR NEWMAN.
ASSISTANT PROFESSOR CONNER.

This study is pursued in all of the classes, commencing with the elementary principles in the Freshman year. During this year the instruction is confined to the application of principles and practice which do not require a knowledge of the sciences related to agriculture.

As the student progresses in the study of the natural sciences, the application of these sciences is taught in their relation to the art of agriculture, special stress being placed upon the protection, improvement, fertilization, and all manipulations of the soil in the preparation for planting and in the cultivation of crops.

The cultivation of each important crop is discussed in the concrete. Special attention is bestowed upon the grasses and their cultivation. In the higher classes the employment and management of labor, farm equipment, and farm management are discussed. All instruction is given by lectures, the subjects being illustrated as far as possible by practical exercises.

Reference-books: Vorhees’ First Principles of Agriculture, Storer’s Agriculture, Experiment Station Bulletins.

Equipment.

The College has a large storage barn provided with silos, a cow barn furnished with various forms of stanchions, a mule barn provided with the most improved forms of stalls and feed-racks, implement and wagon sheds for storage of tools, etc., compost building for making compost in large quantities, and two large cribs for storage of corn.

Among agricultural machinery and implements may be mentioned the following: Self-binder, corn-harvester, Deering ball-bearing mower, Osborne mower, self-dumping rake, check-row corn-planter, Buckeye cultivator, B. F. Avery cultivator, Tower cultivator, disc-cultivator, spring-toothed harrow, smoothing harrows, various forms of pulverizers, manure-spreading machines, fertilizer and grain drill, various forms of small fertilizer drills, Planet Jr. drill, two Planet Jr. plows, scientific mill, stone grist mill, Tornado ensilage cutter, small thresher, hand-gin, rock-crusher, road-machine, three terrace-levels, and a 10 kw. electric motor.
HORTICULTURE.

MR. C. C. NEWMAN.

The course in horticulture consists of horticulture proper, home gardening, truck farming, pomology, viticulture, canning, and experiment work.

Instruction is given by lectures, covering the subject of horticulture in its comprehensive sense. The instruction is continued through the entire course and is illustrated by practical exercises in the garden, the orchard, the vineyard and the greenhouse.

In the practical work, the student is required to labor, and is thereby taught by actual experience the use of tools, the proper mode of preparing, fertilizing and cultivating the soil; shipping, storing, and canning vegetables and fruits; training and pruning vines and trees; propagating plants by seeds, grafts, buds, layers, leaves, and divisions. Instruction is also given in the making and use of hot-beds, cold-frames, mulching, etc., together with the art of forcing, crossing, and hybridizing, and the care of plants in the greenhouse.

Equipment.

The Horticultural building, a two-story frame house, contains the classroom, offices and collections of the horticultural division, and the local office of the United States Weather Bureau.

The equipment for practical instruction in horticulture consists of the following: canning outfit complete; greenhouse, 21x140 feet, heated by hot water; experimental garden, about five acres; orchard, vineyard, and plats of small fruits, about fifty acres; truck farm, about twenty-five acres; and a small nursery.

ENTOMOLOGY.

DR. ANDERSON.

The aim of instruction in this division is primarily to give the student a working knowledge of the science for practical purposes; secondarily, to lay the foundation for further study, should the student desire to continue the subject. Special attention is given throughout to species and groups of insects of economic import-
ance—both noxious and beneficial, together with methods of combating the former intelligently.

**Sophomore Class.**

**GENERAL COURSE.**—Structural, morphological and systematic entomology. Lectures upon the characteristics of the orders, suborders and more important families, with field and laboratory work. Comstock’s Manual for the Study of Insects is used as a guide.

**Junior Class.**

**ECONOMIC ENTOMOLOGY.**—A course in applied entomology, dealing with the more important insect pests of crops and the methods and means of combating them, including the theory and practice of spraying.

**Senior Class.**

**ECONOMIC ENTOMOLOGY.**—Animal Parasites. Lectures upon the parasitic pests of the various farm animals.

**Equipment.**

A large, well-lighted room in the Agricultural building has been assigned to the division and is being properly equipped. Specimens illustrating the orders, suborders, and many of the important families are on hand, and the collection is constantly growing. Twelve simple and three compound microscopes are available for laboratory work, and others are to be added this year. Forests, fields, streams, orchards and greenhouses are convenient.

**SPECIMENS WANTED.**—A collection to represent the insect fauna of the State has been begun. Specimens of insects, larvae, cocoons, etc., as well as notes upon any insects in the State, will always be thankfully received.

To send living specimens it is only necessary to inclose them in a tight box with a supply of food or food-plant and mail them to the Division of Entomology. A metal box is preferable. Dead specimens of larvae or insects may be sent in cotton previously moistened with alcohol or formalin and inclosed in a tight metal box.

**BOTANY.**

**MR. ROLFS.**

**Sophomore Class.**

SECOND TERM.—During the second term of the Sophomore year the students of the Agricultural course receive instructions in general botany. During this term they become familiar with the
general structure of plants—beginning with the simplest forms and studying to the complex. Incidentally they learn how to manipulate the simple and the compound microscope. A large portion of the time is spent on flowering plants. As this term’s work is the basis for the more advanced botanical studies in the course, considerable stress is laid upon the underlying principles of plant morphology and plant structure.

**Junior Class.**

**FIRST TERM.**—During this term lessons in plant physiology are given. Some of the simple and fundamental principles are studied. Experiments with water cultures and others of a similar nature are carried on by the students.

**SECOND TERM.**—During the second term the class takes up the study of plant diseases. Attention is directed especially to the diseases of economic plants. They are taken up from a systematic standpoint of the parasite. A careful microscopic study is made; its effect on the pest noted, and the remedy learned.

The practical work consists in microscopic study in the laboratory, exercises in studying the diseases in the field, and collecting specimens—each student collecting and naming correctly an herbarium of twenty-five species of parasitic fungi.

**Senior Class.**

**FIRST TERM.**—During the first term the class receives instruction in bacteriology. During this work the student becomes familiar with the different methods of sterilization and different culture media. Several species of bacteria are cultivated, mounted and studied in detail. The class is also required to isolate and study a bacterium from a mixture of species. It is the object of the course to acquaint the students with the fundamental principles of bacteriology.

**Equipment.**

The botanical laboratory is located on the third floor of Agricultural Hall. The northern exposure makes it especially suitable for microscopic work.

In the laboratory equipment there are the following pieces of apparatus: twenty-five simple microscopes, twenty-two compound microscopes (six of these are bacteriological microscopes), incubator, glass dishes, sterilizer, embedding bath, students' microtome, section cutters, etc.

A creditable beginning has been made in collecting an herbarium. This collection includes plants collected in the State, plants received by exchange, and a donation of nearly a thousand mounted specimens from Dr. A. P. Anderson. This donation includes plants collected in Minnesota and in Europe, including many species not present in the flora of South Carolina.
DAIRYING.

ASSISTANT PROFESSOR CONNER.

Junior Class.

Students who take the agricultural course receive instruction in dairying. In the dairy building, which is equipped with apparatus for testing milk, separating, butter-making, cheese-making, etc., practical instruction is given and opportunity afforded students of learning the various operations carried on in a well-conducted private dairy, creamery or cheese factory. Wing’s "Milk and its Products" is used as a text-book.

Those wishing to take a short practical course in dairying may enter Nov. 15 and continue ten weeks, during which time instruction will be given in butter making, care and use of the separator, milk testing and feeding and care of stock. This course is designed to meet the wants of those desiring a working knowledge of dairying. Students taking a short, special course will be required to board out of barracks. Board will cost about $10 per month.

Equipment.

The commodious dairy building has an independent steam plant and water-works, and is supplied with everything needed for making butter and cheese on a factory and private dairy scale, including the leading makes of cream-separators, churns, butter-workers, milk-testers. Students are thoroughly drilled in the use of this apparatus.

ANIMAL HUSBANDRY.

ASSISTANT PROFESSOR CONNER.

Sophomore Class.

STOCK BREEDING.—A careful study of the different types of domestic animals is pursued, and the student is thoroughly drilled in the principles and methods of successful breeding, heredity, atavism, variation, selection, fecundity, influence of environment, in breeding, cross-breeding, grading, influence of previous impregnation.

The different breeds of horses, cattle, sheep and swine are considered, and those best adapted to the South are discussed at length.
The College farm has a number of breeds of domestic animals which serve to illustrate the subject.

As a supplement to this work, the student is drilled in the use of the score-card, which fixes the different types and breeds firmly in his mind.

Senior Class.

STOCK FEEDING.—This course includes the following subjects: Laws of animal nutrition; composition of the animal body; fodders as a source of nutrients; digestion, resorption, circulation, respiration, and excretion; formation of muscle, flesh and fat; composition and digestibility of feeding-stuffs, and their preparation and use; feeding for fat, for milk, for wool, for work and for growth.

The available feed-stuffs of the South are discussed at length. Henry's "Feeds and Feeding" is used as a text-book.

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POULTRY RAISING.

The work of this division will be directed in such lines as will furnish practical, useful information to the people, and thereby stimulate interest in and attention to this important source of family supply and revenue. Under the auspices of the Experiment Station experiments will be conducted in rearing the various breeds of poultry and the English ring-necked and Mongolian pheasants.

The work and equipment in this division will serve as valuable object-lessons to students of the College, and will be used to illustrate the lessons of the class-room.

Equipment.

The plant of this division consists of 36 pens 20x32 feet, and in each a house 6x8 feet. For every four pens there is a run 80x150 feet, all enclosed with poultry cabled wire. There are also several styles of incubators, brooders and other modern appliances.

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VETERINARY SCIENCE.

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DR. NESOM.

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The object of this course is to acquaint the agricultural student with the elementary principles of veterinary medicine and surgery. The time is too short to make professional veterinarians of those
who take this study, but is sufficient to make them more intelligent stockmen when graduated. The entire time devoted to the several veterinary studies is equivalent to four hours lectures and three hours practical work a week for one year, and is given as follows:

**Junior Class.**

**FIRST TERM.**—Lectures on anatomy and physiology of the domesticated animals.

**SECOND TERM.**—Lectures on histology, pathology and materia medica.

**Senior Class.**

**BOTH TERMS.**—During the entire Senior year lectures on the principles and practice of veterinary medicine are given once a week. Only the more common diseases of farm animals can be considered during the limited time devoted to this study, but special attention is given to those diseases that occur in epizootic outbreaks. Among these may be mentioned glanders, anthrax, Texas fever, tuberculosis, cholera, sheep "scab," hydrophobia, and favus. Careful consideration is given to the bacteriological and parasitic agencies causing the diseases.

**LABORATORY.**—A limited amount of laboratory work is given during the lectures to illustrate the structure of normal and pathologic tissues and the simpler reactions in chemical physiology. In pharmacy each student is required to compound a limited number of prescriptions.

**CLINIC AND DISSECTION.**—Every Monday afternoon a free clinic is held at the veterinary hospital. This is liberally patronized by the stockmen of the surrounding country, and affords the students ample practical work in surgical operations and the treatment of animal diseases. Advantage is taken of accidental material for post-mortem examination and gross dissection.

**POSTGRADUATE AND SPECIAL WORK.**—Graduates of this and other colleges and young men found proficient in the elementary branches of science and literature may receive special instruction. This work is designed as a preparatory course to entrance into a regular veterinary college. The special needs of each student are considered, and the work is planned to meet his individual case. The course taken here will shorten the time necessary for graduation from the leading veterinary colleges, whether the student desires to become a veterinary practitioner, government meat-inspector, or army veterinarian.
Equipment.

The veterinary class-room and laboratory is about 30x50 feet, provided with steam heat, electric lights, water, gas, and the necessary furniture. It is amply supplied with chemicals and the best imported apparatus for technical work.

The veterinary hospital is a structure of modern design, containing apartments for office, drugs, dissecting and horse-shoeing, besides stalls, feed-bins, water supply and electric lights. One of the best revolving operating tables has been provided. The surgical instruments and appliances now on hand, with a few additions, would do credit to a regular veterinary college. A complete outfit for horse-shoeing is provided. A good stock of drugs and chemicals is kept on hand and prescriptions are filled upon request.

It is hoped that in the near future the facilities may be so extended as to include practical work in caring for animals undergoing treatment in hospital, horse-shoeing, and the inspection of meat-producing animals designed for slaughter.

CHEMISTRY.

PROFESSOR HARDIN.
ASSISTANT PROFESSOR BRACKETT.
MR. SHIVER.

Sophomore Class.

BOTH TERMS.—General Chemistry.—Inorganic chemistry and the leading facts and principles of organic chemistry. Textbook, Roscoe's Elementary Chemistry. Laboratory.—Introductory work and qualitative analysis. Text-book, Jones' Junior Course in Practical Chemistry.

Junior Class.

BOTH TERMS.—Industrial and Analytical Chemistry.—Air, water, food, clothing, building materials, and other articles used in every-day life. The metallurgy of iron, copper, lead, tin, zinc, silver, and gold. Laboratory—Qualitative and quantitative analysis and assaying. Text books, Jones' Junior Course in Practical Chemistry, Fresenius' Qualitative and Quantitative Analysis.

Senior Class.

BOTH TERMS.—Agricultural and Analytical Chemistry.—The composition of plants, the sources of plant-food, the composition of soils, the improvement of soils by chemical means, the composition and manufacture of fertilizers, the composition of feeding-stuffs and of dairy products. Text-book, Johnston's Elements of Agri-

**Equipment.**

THE CHEMICAL LABORATORY is a two-story brick building, 50x80 feet, covered with slate, and finished inside with Southern pine.

On the first floor there are eight rooms. Five of these are appropriated for State Analytical and Experiment Station work, and supplied with all the necessary chemical and optical apparatus. Of the other rooms on this floor, one is a balance room for students, one an office, and the third is fitted up as a laboratory for advanced students. The basement is used for assaying and for storage.

On the second floor there are five rooms. The qualitative laboratory, which is the largest of these, is 36x48 feet, with a pitch of seventeen feet in the clear. It will accommodate sixty students at a time, and is provided with hoods for carrying off noxious gases, convenient working tables, water, gas, and all necessary appliances for experimental work. The other rooms on this floor are the lecture-room, professor's laboratory, an office, and a room for gas analysis.

The Chemical Library is supplied with Wagner's Chemical Technology, Payne's Industrial Chemistry, Lunge's Sulphuric Acid, Thorpe's Dictionary of Applied Chemistry, Rickett's Notes on Assaying, Brown's Assaying, Phillips' Metallurgy, Deherain's Treatise on Agricultural Chemistry, Storrer's Agriculture in some of its Relations with Chemistry, Wiley's Agricultural Analysis, and with other valuable works on theoretical and applied chemistry, as well as with American and foreign journals.

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**GEOLOGY AND MINERALOGY.**

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**PROFESSOR LEWIS.**

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**Senior Class.**

FIRST TERM.—General Geology.—Dynamical, structural and historical geology, with special reference to the development of the North American continent. The influences of geologic phenomena on man are carefully pointed out, particularly in the consideration of soils, the agents of erosion, transportation and deposit, and resultant topographic forms.

FIRST TERM.—Mineralogy.—Elements of crystallography; laboratory study of crystal forms by the use of models and natural crystals; construction of simple crystal drawings; chemical and physical properties of minerals; chemical and physical tests of known minerals; determination of unknown specimens. Special at-
tention is given to the useful minerals and those forming the chief constituents of rocks.

SECOND TERM.—Economic Geology.—The general characters and modes of formation of ore-deposits, with special reference to ores of the more useful metals; iron, copper, lead, silver, gold, etc. Also a brief discussion of the origin and distribution of the principal nonmetallic minerals; coal, petroleum, natural gas, mineral fertilizers, building stones, salts, clays, etc. The course deals especially with economic deposits of the United States, with particular reference to those of South Carolina so far as at present known.

Equipment.

The teaching collections contain over 1,000 labeled specimens of typical rocks, minerals and fossils, besides abundant material for laboratory study. The collections are arranged in systematic order in glass cases, and are always available to students. The class-room is also furnished with large physical wall-maps of all the continents and an 18-inch terrestrial globe.

For practical work in mineralogy the laboratory is supplied with water and gas and the necessary apparatus and reagents for the determination of minerals by means of their physical and chemical properties.

Standard works on geology and mineralogy are kept in the laboratory for reference. The College is a stated repository for all publications of the United States Geological Survey, and many valuable maps and reports have been received from this source, including all geologic folios that have been issued and a select series of topographic maps for instruction in physiography. A number of valuable maps are also supplied by the United States Coast and Geodetic Survey.

STATE SPECIMENS WANTED.—Specimens of all rocks, ores and minerals of the State will be gladly received and utilized, both for the instruction of students in the State's resources and as a permanent exhibit for all who may be interested in their development. The professor in charge will correspond with any one who is willing to furnish such specimens, and give information, when desired, as to their nature and value.

APPLIED MECHANICS AND MECHANICAL ENGINEERING.

Professor Boehm.

In these courses the student is taught the applications of his scientific, mathematical and technical knowledge to the design and construction of engineering structures, and of machinery and manufacturing plants in general. In previous shop practice the student has acquired some knowledge of the character of engineering materials and a certain necessary familiarity with shop methods. He is, therefore, prepared to study the strength of these materials, their
behavior under the various stresses to which they may be subjected,
and the methods of proportioning the material in a given machine
or structure so as best to withstand these stresses. The principles of
mechanism are also taught and a brief course of lectures is given
on engineering specifications and the law of contracts. Instruction
is given mainly by lectures, supplemented by laboratory practice
and by the solution of a wide range of practical problems.

Junior Class.

FIRST TERM.—Elementary Mechanics.—Motion, force, ve-
locity, work, energy, power, stress, strain, elasticity, resi-
lience, moments of force, centre of gravity, moment of inertia, momentum,
SECOND TERM.—Mechanism.—Spur, bevel, and screw gear-
ing, belt gearing, lobed and elliptic wheels, epicyclic trains, escape-
ments, ratchet motions, link motions, quick return motions, cam

Senior Class.

BOTH TERMS.—Applied Mechanics.—Theory of the resis-
tance and elasticity of engineering materials; tension, compression,
shearing and combined stresses; flexure of beams and columns;
torsion of shafts; statics of framed structures and of flexible cords;
graphical statics; theory of the arch; hydraulics. Text-book,
Church's Mechanics of Engineering.
SECOND TERM.—Mechanical Engineering.—Lectures on the
design and construction of steam boilers, heaters, pumps and in-
jectors; theory and design of simple, compound and triple expan-
sion steam engines, gas and gasoline engines, hot air engines, air
compressors and motors, ice and refrigerating machinery, heating
and ventilating systems, transmission of power; engineering speci-
fications and the law of contracts.
BOTH TERMS.—Mechanical Engineering—Laboratory Prac-
tice. Study, use and calibration of water-meters, weirs, steam
gauges, indicators, dynamometers, calorimeters; efficiency tests of
screw-jacks and hoists; tests of fuels and lubricants; tests of build-
ing materials, as iron, wood, brick, cement, etc.; erecting, lining up
and setting the valves of plain slide-valve and automatic cut-off
steam engines; indicator practice; horse-power and efficiency of
steam, gasoline and hot-air engines and air-compressors and mo-
tors; efficiency trials of steam boilers; duty trial of steam pump
and of College pumping engine. Reference books, Carpenter’s Ex-
Experimental Engineering, Smart's Engineering Laboratory Practice, Thurston's Steam Engine.

Equipment.

This laboratory occupies a room 41x45 feet, and contains the following equipment: For steam engineering: 15-horse power horizontal, locomotive type boiler; 6-horse power vertical boiler; Erie 6-horse power plain slide-valve steam engine; 6-horse power vertical steam engine built in the shops; Wheeler surface condenser with combined air and circulating pumps; 2-in. x3-in.x4-in. duplex steam pump; set of steam-gauge testing apparatus; Carpenter's separating steam calorimeter; two throttling steam calorimeters; five steam engine indicators of various makes; two standard injectors. For hydraulic engineering: two hydraulic rams; Pelton water motor; power duplex pump; three weirs; recording altitude gauge; six pressure and altitude gauges. For compressed air: Clayton air compressor with jacketed cylinders; improved air motor. For fuel and lubricants: Carpenter's fuel calorimeter with scales, balances, and oxygen generating devices; standard viscometer. For testing building materials: 100,000-pound Olsen automatic vertical testing machine driven by 5-horse power Westinghouse electric motor, and fitted for tension, compression, and transverse testing; Fairbank's cement testing machine; 3,000-pound transverse testing machine. The laboratory also contains a 5-horse power Otto gasoline engine, an Ericsson hot-air engine, a 6-horse power transmission dynamometer, graduated to real horse power direct and built by students, and an assortment of standard thermometers, weights and measures. The apparatus is so arranged that any of it may be used for separate or combined tests, or for any original investigations. Besides the equipment in this room, the electric light and power plant, the heating plant of the College and barracks, the isolated plants at the dairy, horticultural grounds and pumping station are available for instructional purposes.

ELECTRICAL ENGINEERING.

MR. RIGGS.

Junior Year.

Three hours per week for the whole session are devoted to the study of electricity and magnetism, and the elementary design of electro-magnetic mechanism. The work of this session is largely in laying a foundation for the more strictly engineering work of the Senior year.


LABORATORY WORK.—Three hours per week for the session are devoted to experimentally verifying fundamental electrical laws, measurements of current, electro-motive force, resistance,
quantity, induction, capacity, permeability, calibration of instruments, etc., etc.

Reference books, Ayrton’s Practical Electricity, Stewart and Gee’s Practical Physics, Nichols’ Physics, Vol. I, Gray’s Absolute Measurements, Ewing’s Magnetic Induction, Henderson’s Practical Engineer.

Senior Year.

Five hours per week are given to the study and design of dynamo electric machinery. Special attention is given in the second half session to the study of alternating currents, and their applications to light and power. The course is supplemented by lectures and problems on Synchronous and induction, motors; design of transformers, transmission lines and plants; multiphase wiring, etc.

A dynamo design, with complete set of drawings, is required of each student.

Text books, Thompson’s Dynamo Electric Machinery, Jackson’s Alternating Currents, Vol. II.

Reference books, Weiner’s Dynamo Electric Machines; Bell’s Electric Power Transmission.

LABORATORY WORK.—Three hours per week for the session is devoted to the care, management and testing of arc, incandescent, and alternating current generators; direct current synchronous and induction motors; arc lamps; transformers; calibration of station instruments; and incandescent lamp photometry. Practical work in house wiring, installation of meters, building and winding electrical apparatus and machines is also given.

Equipment.

ELECTRICAL INSTRUMENT LABORATORY.—This is a separate brick building, designed especially for delicate electro-magnetic work—no iron, steel, or other magnetic substances having been used in its permanent construction. It contains in addition to all necessary elementary apparatus the following instruments of precision: Kelvin-Deka ampere balance, Kelvin four-coil astatic galvanometer, four D’Arsonval dead-beat galvanometers, large ring tangent galvanometer, three Elliott Brothers’ standard resistance sets, Elliott Brothers’ standard tangent galvanometer, Queen’s standard ballistic galvanometer, Nalder Brothers’ sensitive galvanometer, Rowland-D’Arsonval ballistic galvanometer, Willyoung standard condenser, Becker’s chemical balance, Carhart-Clark standard cell, thermometers, Wheatstone bridges, etc.

DYNAMO LABORATORY.—To meet the demands of larger attendance, and increased equipment, a new building has been provided in which is installed the dynamo-electric machinery. This building also contains a class room and a dark room for extensive photometric work. It is a single story brick structure 37x80 feet with basement for supply rooms.

The first story is divided into a class room 25x35 feet, and a dynamo lab-
oratory room 53x35 feet. The building is heated by steam and lighted by enclosed arc and incandescent lamps.

The lecture room has elevated seats and is equipped with a complete line of illustration models, apparatus and electrical instruments. It will contain an electro magnet capable of supporting the weight of two tons.

The dynamo room will contain in addition to rheostats, speed counters, spring balances, etc., the following instruments and machines; set of Weston portable direct current instruments, set of General Electric portable alternating current instruments; Weston standard laboratory volt-meter and watt-meter; Queen watt-meter; Thompson’s recording watt-meter; Ayrton’s Cardew; Kelvin electrostatic volt-meters; Scheaffer & Budenberg tachometer; Westinghouse station volt-meter; two 3,000 watt transformers and one 600 watt transformer; General Electric 7 kw. rotary multiphase converter and 3-horse power induction motor; 5 kw. 3 phase rotary converter, and 1-2 horse power 3 phase induction motor (both built by students); Thomson-Houston & Brush arc generators; 20 kw. direct current generator; one 10 horse power and two 3 horse power direct current motors; two 2 1-2 kw. revolving field alternators (in process of construction here); 15 horse power Payne automatic engine; two 50-light lamp loads; six large capacity iron wire resistances; leading types of open and enclosed arc lamps; leading types of light-ning arresters.

THE DARK ROOM contains a complete outfit for high potential, high frequency and X-ray work, and a Deshler-McAllister central station type photometer, with rotating stand for incandescent lamp testing.

COLLEGE POWER AND LIGHT PLANT.—The machinery in the dynamo laboratory is driven by the 15 horse power Payne engine and a 20 horse power motor. Steam and electric power is furnished by the power plant situated in a neighboring building. This plant consists of an 85-horse power Corliss engine, driving an 18 kw. Lundell generator, a 30 kw. Weston generator and a 30 kw. General Electric Company’s multipolar generator. This station furnishes power to ten motors ranging from 3 to 30 horse power. These motors are used at different points on the College property for a variety of purposes, such as pumping water, driving agricultural machinery, supplying power for machine shop, wood shop, textile department, etc. Several of these are at a considerable distance from the power station, thus furnishing examples of electrical transmission of power. Three of these, 7-horse power each, were built by students. In addition to power for driving motors, the same generators furnish electricity for lighting the barracks and other College buildings. Students have access to this plant, and are thus enabled to see the practical workings of a combined electric light and power plant, and to test its efficiency.

The aim of the course is to make practical as well as theoretical electrical engineers.

REQUIREMENTS.—Students desiring to take a special course in electrical engineering should remember that no one can hope to become an electrical engineer who has not the necessary foundations in mechanical engineering, to which electrical engineering is the superstructure. Two-thirds of an electrical engineer’s training must be mechanical. No special classes will be formed and students desiring to enter the Junior class will be expected to be prepared on elementary mechanical drawing, physics and chemistry, and on mathematics, through plane trigonometry. They will be expected to take with the Junior class, in addition to their electrical studies, physics, mechanics, mechanical drawing and machine shop work. Without these additional branches the student will not be prepared for the more strictly engineering work of the Senior year.

To enter the Senior class a student must be proficient in the work of the Junior year, in which physics and calculus are completed.

In addition to the electrical subjects prescribed for the Senior year he must take—unless he is proficient along these lines—mechanics, mechanical
engineering and laboratory, machine shop, drawing, and machine design. Students who are not prepared, or are not willing to take the other subjects necessary to successful study of electrical engineering, will not be permitted to take a special course.

PHYSICS.

M. R. POATS.

The course in Physics is intended to extend over the Sophomore and Junior years for students in Civil, Mechanical and Electrical Engineering. Students in the Textile Department take Physics during their Sophomore year only.

The instruction is by lectures and recitations, especial stress being laid upon those principles and facts which are fundamental to the several engineering professions. The lectures and recitations are illustrated by numerous experiments before the class.

In the Physical Laboratory the student is taught to perform for himself all the experiments of a general laboratory course. The Properties of Matter, the Laws of Mechanics, Heat, Electricity, Magnetism, Light and Sound are investigated. Students are required to make accurate and neatly written reports of all experiments.

Sophomore Class.

SECOND TERM: Electricity and Magnetism.
Text-Books: Gage's Physics.

Junior Class.

BOTH TERMS: Sound and Light.
Text-Books: Gage's Physics, supplemented with notes and lectures.
PHYSICAL LABORATORY.

Junior Class.

(2 hours per week.)

FIRST TERM: Experimental determination of the physical properties of matter and the verification of Laws of Mechanics, Electricity and Magnetism.

SECOND TERM: Experiments with Heat, Sound and Light.


Equipment.

The Physical Lecture Room and Laboratory is situated in the main College building, is 33x60 feet and is well equipped for both the lecture and experimental work of a general course in physics.

DRAWING.

Mr. Hancock.
Mr. Lee.

Freshman Class.

Free-Hand Drawing.—Graded exercises in sketching from plaster casts and other objects in pencil, charcoal and ink.

Mechanical Drawing.—Exercises in the use of drawing instruments; working drawings of simple parts of machines from objects; geometrical problems with circles and straight lines; lettering.

Sophomore Class.

MECHANICAL DRAWING.—Working drawings of machines or parts of machines from sketches and specifications.

DESCRIPTIVE GEOMETRY.—Problems with lines and planes; simple solids in simple positions; intersection and development of surfaces; shades and shadows; axonometric projection and perspective.

Junior Class.

MECHANICAL DRAWING.—Working drawings of machines from sketches and specifications; drawings of the steam engine;
dynamo electric machines; plans and details of bridges and buildings.

Senior Class.

MECHANICAL DRAWING.—Working drawings of machines from sketches and specifications. Work is assigned with reference to the course of study the student is pursuing. Drawings required in graduation theses.

Equipment.

The drawing rooms occupy the entire third floor of the Mechanical building, 51x69 feet. The third and fourth floors of the tower are also used as dark room and blue-print room, respectively. The free-hand and mechanical drawing rooms are equipped to accommodate 35 students each, with cases, boards, T-squares, etc., for over 200. Students are allowed the use of necessary instruments and apparatus free of charge.

WOODWORK.

MR. BARNES.
MR. KLUGH.

The course in wood-work does not aim to make the student a skilled carpenter, but rather to teach the proper use of tools, and impress the importance of working to exact dimensions. At the same time, it gives a certain amount of manual dexterity, useful in every vocation.

The course covers two years, beginning with the most elementary principles and advancing gradually by a series of graded exercises to the more complicated constructions where special methods and tools are required. All work is done from working drawings and the methods of commercial shop management are constantly employed.

Freshman Class.

BOTH TERMS: Names and uses of tools; graded exercises in carpentry, joining and wood-turning; construction of articles from working drawings; use of turning lathe and other simple machinery; construction of boxes, desks, etc., involving dove-tailing, gluing, polishing; turning of cups, vases, Indian clubs and other wooden articles.
Sophomore Class.

BOTH TERMS: Use of wood-working machinery, as planer, jointer, circular saw and molding machine; pattern work with graded exercises, showing use of and reason for draft, halving, core prints and core boxes; patterns for machines under construction; advanced turning and cabinet work.

Equipment.

The wood shop occupies the two-story wing on the east side of the Mechanical Engineering building, 45 x 100 feet. The lower floor contains the freshman class room, equipped with fifteen work benches and sets of tools, six turning lathes with tools for each, and other tools for hand work. On this floor is also the planing mill machinery consisting of a double roll planer, power rip and cut-off saws, band saw, scroll saw, 16-inch jointer, double headed shaper, moulding machine, mortising machine, tenoning machine, emery grinder, lathe with 12-foot bed, etc.

The upper floor is devoted to the work for the sophomore class, and is fitted up with fifteen work benches and sets of tools, six 10-inch turning lathes, one large pattern lathe, one combination saw and boring machine, two jig saws, one Universal trimming machine, special door and sash clamps, steam glue pots, mitre cutters, etc.

The power is supplied by electric motors conveniently located in the various rooms. A large lumber yard and dry-kiln serve to season and provide dry timber at all times.

MACHINE SHOP.

MR. SIMPSON.

Junior Class.

BOTH TERMS: Instruction begins at the bench with exercises in chipping, filing, scraping and polishing. Castings and drawings are given the student and he is required to chip, file, scrape and polish each casting into the exact form and size represented by the corresponding drawing. From bench work the student is advanced to machine work, where he is taught turning, boring, polishing, drilling, threading, planing, milling, grinding, etc., in iron, brass and steel. In all cases the exercises are required to be worked to drawings. The graded course of exercises is designed to teach the fundamental principles and practices of machine metal-work from the simplest to the most difficult operations. After completing this course of exercises, work is begun in the construction of tools, apparatus, etc.
Senior Class.

BOTH TERMS: The Senior year is devoted to more advanced work in the construction of engines, dynamos, motors and other machines. The student is encouraged to work from his own designs as far as possible, but is guided and directed by the instructor in charge.

Equipment.

The machine shop is located in the south west wing of the Mechanical building which wing is 45x100 feet, well lighted, heated and ventilated. It contains eighteen benches with vises and kits of tools for each bench and the following machine tools: 1 18-in.x12 foot engine lathe; 1 18-in.x8 foot engine lathe; 3 14-in.x6 foot engine lathes; 4 14-in.x6 foot Lodge & Shipley lathes; 1 10-in.x4 foot F. E. Reed pattern maker's lathe; 1 15-in.x8 foot speed lathe; 1 18-in. drill press; 1 28-in. back geared drill press; 1 22-in.x22-in.x6 foot Powell planer; 1 Cincinnati cutter and tool grinder; 1 15-in. Gould and Eberhardt crank shaper; 1 dry emery grinder; 1 12-in. power hack saw; 1 36-in. grind stone; 1 22-in. Leland and Faulconer wet emery tool grinder; 1 American twist drill grinder; 2 14-in.x6 foot F. E. Reed compound rest engine lathes, and 2 14-in.x6 foot Hendey compound rest engine lathes. The tool room in connection with the shop contains all tools, etc., necessary for use with the machines.

The 6 kw. motor which drives the machinery was built by students.

FORGE AND FOUNDRY.

MR. JOHNSON.

MR. LILES.

Freshman Class.

BOTH TERMS: Forge Work.—The course in forging begins with instruction in the names of tools and building and managing fires. Graduated exercises are then taken up, including drawing out, upsetting, bending, punching, twisting, welding of iron, welding of steel, welding of steel and iron, annealing, hardening, tempering, case-hardening, bluing and browning. Some work is then done in ornamental forging. The practical instruction is supplemented, during the progress of the course, by lectures and notes on the principles involved, and the details of the best forge practice are thoroughly explained.

Sophomore Class.

BOTH TERMS: Foundry Work.—Students are taught the names and uses of tools; tempering of molding sand; molding and
patching of molds. Patterns of various shapes and sizes are used to illustrate the different principles of molding, venting and gating; the use of risers, pressure gates, skim gates, gaggers, chaplets, facing sands; feeding of castings; core-making; grading and mixing of iron; charging and managing the cupola. Four weeks are devoted to work in the brass foundry. The practical instruction is supplemented by a course of lectures.

**Equipment.**

FORGE SHOP.—This is a room 37x60 feet, situated in a wing of the Mechanical building. It is equipped with 18 Buffalo forges and steel-faced anvils, with sets of hammers, tongs, swages, fullers, flatters, etc. Continuous blast is furnished by a Buffalo blower driven by an electric motor. Steel hoods and stacks, which enter ventilators on the roof, serve to carry off the smoke by natural draft. The shop is also supplied with vises, swage blocks, emery wheel, bending cone, etc.

FOUNDRY.—This building has recently been enlarged to meet the growing demands of the College, and now occupies a space 43x76 feet. It is equipped with a 26 inch Victor Collier cupola, a Millett's improved core oven, a two-ton post crane, 8 improved moulder's benches, an 18-inch brass furnace with its usual complement of crucibles, tongs, etc., full sets of moulder's tools for the accommodation of 20 students, besides the usual accessories to a foundry, such as ladles, flasks, etc.

**MATHEMATICS.**

PROFESSOR BRODIE.

ASSISTANT PROFESSOR WALLER.

This course presupposes a thorough knowledge of arithmetic and of algebra through quadratics.

**Freshman Class.**

FIRST TERM: Complete Algebra. Quadratics (reviewed); simple indeterminate equations; equations; inequalities; theory of exponents; logarithms; proportion and variation; series, binomial theorem; continued fractions; theory of limits; indeterminate coefficients; exponential theorem; equations in general. Text-books, Wentworth's Complete Algebra.

SECOND TERM: Plane Geometry. Rectilinear figures; circles; similar figures; comparison and measurement of surfaces of polygons; regular polygons and circles. Special attention is given to the formation, on the part of students, of the habit of clear and

Sophomore Class.

FIRST TERM: Trigonometry. Functions of acute angles; right triangle; goniometry; oblique triangle; applications. Text-book, Wentworth's Trigonometry and Tables.

PLANE SURVEYING.—All regular students take plane surveying on completing trigonometry in the Sophomore year. This course includes the general principles and fundamental operations of surveying with compass, level and transit. The object of the instruction is to make practical surveyors, familiar both with the mathematical principles involved and the art of combining the theory and the practice. The field work includes actual surveys of extensive tracts of land, of which the areas are computed and accurate plats are drawn. Experience is given in retracing the lines of old surveys, in numerous problems of laying out and dividing up land, and in locating intricate, irregular boundaries. Practice is also had in section leveling, laying out terraces, ditches, etc. Ample training is here furnished for the needs of agricultural students, and a good preparation is given for the higher work of the engineering courses. Text and reference books: Davies-Van Amringe's Surveying; Gillespie's Surveying.

For agricultural students, the mathematical course ends with the Sophomore year.

Junior Class.

FIRST TERM: Analytical Geometry. Points and right lines in a plane; points and right lines in space; transformation of coordinates; circle; parabola; ellipse; hyperbola; higher plane curves; surfaces of revolution. Text-book, Nichols' Analytical Geometry.
SECOND TERM: Differential Calculus. Differentiation of algebraic functions; transcendental functions; successive differentiation and development of functions; functions of two variables; tangents and asymptotes; maxima and minima; radius of curvature; evolutes and involutes; envelopes.
Integral Calculus.—Elementary forms of integration; rational fractions; integration of irrational fractions; successive reduction; integration of functions of two variables; lengths of curves; areas
of plane curves; rectification of curves; cubature of volumes. Text-book, Osborne's Differential and Integral Calculus.

CIVIL ENGINEERING.

PROFESSOR BRODIE.

To begin the work in Civil Engineering the student must have completed the mathematical course through trigonometry and plane surveying. For the Senior course he must have a working knowledge of analytical geometry and calculus.

Junior Class.

BOTH TERMS.—Use and adjustment of transit, stadia, solar compass, and plane-table; topographic surveying with transit and stadia; railroad topography; triangulation; geodesy; city and hydrographic surveying; map and plan drawing, topographical symbols, etc.

Highway Engineering.—Location, construction and maintenance of the country roads and city streets; advantages of various materials for road covering; effects of grades and surface upon the cost of transportation; plans and specifications; practical problems in change of grade and relocation, from surveys of existing roads.

Theory of Railway Construction.—Preliminary and location surveys; location from contour map; laying out of simple and compound curves; setting of slope stakes; computation of earthwork; switches; turnouts; theory of economic location; effects of grades, curves and length upon the cost of operation. Text and reference books: Johnson's Higher Surveying; Gillespie's Roads and Railroads; Burns' Highway Construction; Carhart's Field Engineering; Wellington's Economic Location.

Senior Class.

BOTH TERMS.—Railway Engineering. Surveys are made for a line of railway a mile or more in length; the necessary plans, profiles and cross-sections are prepared; grades are determined, curves laid out, slope stakes set, and all the needed measurements made to enable the student to compute the excavations and embankments, and to estimate the cost of construction.
SURVEYS OF WATER POWERS.—Discharge of stream, head and available power; form and dimensions of pond or reservoir; detailed topography of site for dam and determination of its form and dimensions for stability.

STRUCTURES.—Building materials; mechanics of construction; derivation of practical formulas; masonry; foundations on land and in water; stability of walls and arches; analytical and graphical investigation of stresses in plate girders, Howe, Pratt, Warren and other types of highway and railroad bridges, and various forms of roof trusses; bridge design.

HYDRAULIC ENGINEERING.—The laws of pressure and flow of water and other principles of hydrostatics and hydraulics are taught, both theoretically and practically; measurement of volume of discharge by weir or miner’s inch; turbines and other water wheels; construction of water-works for towns and cities.

Text and Reference Books: Wheeler’s Civil Engineering; Merriman’s Mechanics of Materials; Merriman and Jacoby’s Roofs and Bridges; Merriman’s Hydraulics.

Equipment.

The collection of field instruments contains the following: Two 6-inch vernier compasses; 20-inch wye level; engineer’s transit, with stadia; planeltable, with 9-inch telescope, vertical circle and stadia; drainage level; 12-foot self-reading leveling and stadia rod; 12-foot New York leveling rod; 10-foot cross-section rod, graduated; Gurley’s clinometer, reading to degrees; two surveyor’s chains; engineer’s chain; standard 100-foot steel tape, graduated to hundredths of a foot; and full supply of ranging poles, flag poles, and other accessories. There are also sets of drawing instruments for office work.

In addition to the drawing done under the immediate direction of the instructor in this division, the regular work in drawing and designing provided for civil engineering students is arranged with special view to their exact needs.

ENGLISH.

PROFESSOR FURMAN.
ASSISTANT PROFESSOR M’LUCAS.
ASSISTANT PROFESSOR DANIEL.

The purpose of the course in English is to enable the student to acquire the power to express his thoughts with clearness, precision and force; and to cultivate in him a taste for good literature.
Elementary English grammar and the rudiments of composition are taught in the Subfreshman classes.

**Freshman Class.**

Lockwood's Lessons in English; Strang's Exercises; readings from Irving and Scott; exercises in composition; supplementary readings.

**Sophomore Class.**

Clark's Practical Rhetoric; weekly exercises in composition; supplementary readings.

**Junior Class.**

Pancoast's English Literature; Hawthorne and Lemmon's American Literature; critical study of Macaulay's Warren Hastings; monthly essays; supplementary readings.

**Senior Class.**

Study of Shakespeare; Dowden's Primer and the reading of three plays; advanced rhetoric; monthly essays; supplementary reading; exercises in elocution.

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**HISTORY.**

**PROFESSOR MORRISON.**

The course in History includes History of the United States, South Carolina History, General History, Commercial Geography, Civics, and Political Economy.

The method of instruction is a combination of the text-book and lecture methods, with parallel readings, under the instructor's direction as far as practicable. The class-room is supplied with globe, charts, maps and works of reference, in the use of which the young men are carefully trained. The students make liberal use of the many volumes of poetry, historical romance, biography and history found in the College library.

The History of South Carolina and the History of the South receive special attention. "A people which takes no pride in the noble achievements of a remote ancestry will never achieve anything worthy to be remembered by remote descendants." Every
effort is made to enable the young men to see and feel as their fathers, and forefathers, saw and felt.

Text-Books: Eggleston’s History of the United States and its People, (Sub-Freshman); Weber’s History of South Carolina and Tilden’s Commercial Geography (Freshman); True and Dickinson’s Our Republic (Sophomore); Myer’s General History (Junior and Senior); Walker’s Political Economy—Briefer Course (Senior).

MILITARY SCIENCE AND TACTICS.

ACTING PROFESSOR SHANKLIN.

Junior and Senior Classes.

BOTH TERMS.—The course in military instruction, as prescribed and followed, is both theoretical and practical. The theoretical instruction, given by recitations and lectures, includes the subjects of organization and administration, grand and minor tactics, logistics, castrametation, military engineering, gunnery and pyrotechnics, military history, etc. The practical instruction includes infantry drill, in the school of the soldier, the company, the battalion and the evolutions of the regiment, in both close and extended order, target practice and guard duty, and in the manual of the piece in light artillery drill. Practice is also given in signaling with the flag.

In addition to the benefit which the general government derives from the military instruction given at this and other colleges, it is believed that the discipline enforced, the habits of punctuality and obedience inculcated, the improvement in bearing and appearance of those instructed, and also the practice in directing and commanding others, which nearly all in course of time get, is of immense benefit to the students individually.

TEXTILE INDUSTRY.

PROFESSOR BEATY.

MR. FRISSELL.

The Textile Department of Clemson College now offers a thorough course of training in theoretical and practical knowledge as
applied to the cotton industry. The students taking this course have the advantage of an exceptionally well equipped mechanical department in which they receive their mechanical training parallel with their textile instruction. The course comprises a system of liberal education and culture as a part of the textile training as it is given at this College. The object has been to make a course in which students will be given, not only special knowledge of textile subjects, but also the advantages of a good general education.

CHEMISTRY AND DYEING.—This course is supplementary to the course in general chemistry pursued by all students in the Sophomore year. The aim is to give a sound elementary knowledge of the chemistry underlying these industries, and to train the student to apply this knowledge to advantage. This division of the course embraces a study of physical and chemical nature of the cotton fibre, natural impurities in the fibre, bleaching agents, mordants and dye-stuffs, coal tar colors, aniline dyes, preparation and application of mordants and dye-stuffs to cotton; experimental dyeing of loose cottons, yarns and cloth; practical work in the dye-house.

CARDING AND SPINNING.—Carding and spinning includes: the cottons of the world; their suitability for different yarns; botany of cotton; structure and composition of the fibre; selection of cotton for different classes of work; classification of cotton; conditions, favorable and unfavorable, to the manipulation of the fibre; strength of fibre; detection of faults in raw cotton; picking and handling of cotton; advantages and disadvantages of the saw gin, construction, speeds, etc.; roller gin, uses, speed, production, etc.; baling of cotton, square and cylindrical bales; compressing and its effects on the fibre; testing for cotton and other fibres.

MIXING.—Reasons for mixing cottons; hand and machine mixing; the advantages and disadvantages of each system; blending, methods of blending, combining of cottons of different characteristics to produce special effects in the yarns.

PICKER ROOM.—The arrangement and construction of picker-rooms; dust trunks; their forms, construction and use; automatic feeders, their construction, action of the feeder on the cotton. speeds and adjustments of the various parts; the breaker-lapper, use, construction, different kinds of beaters, speeds and settings of the different parts of the machine; intermediate and finisher-lappers, feed rolls, evener motions; different kinds of beaters, speeds, settings, etc., advantages of each; shape and setting of screens; regulation of air currents; formation of a good lap; care and operation of lapper; all calculations on the above machines, drafts, length of laps, etc.
CARDING.—The principle and purpose of carding; different types of cards; construction of the feed plate, the licker-in, cylinder, doffer, coiler head, flats, screens, etc.; the different settings of the cards to produce the best results on different lengths and qualities of fibres; the regulation of waste made in the card; card clothing, and different methods of grinding the same; setting of the various parts of the card; calculations.

RAILWAY HEADS AND DRAW FRAMES.—Object, use, construction, advantages and disadvantages of railway heads; comparing metallic and leather rolls; explanation of stop motions and evener; calculations. Principle of drawing slivers; object and purpose of draw frames; method of setting the rolls; size and speed of rolls; distribution of draft between the rolls; stop motions and calculations.

FLY FRAMES—Slubber, intermediate, roving and jack frames; construction of the modern fly frames; the bobbin and flyer lead, method of driving the bobbin in each; the differential motion and its purpose; traverse, builder and stop motions; the formation of a bobbin; drawing rolls and their adjustment; calculations for drafts, twist, lay, tension and other gears.

SPINNING BOTH ON FRAMES AND MULES.—Construction and use of the ring spinning frame; its principal parts; such as rings, spindles, travellers, builder motion, etc.; the effect of twist on the strength, color and elasticity of the yarn; calculations; the spinning mule and its uses; special features; description of the head stock, cam shaft, and other parts; the coping rail and formation of a cop; different movements in the mule and timing of the same; calculations.

MISCELLANEOUS—Reelings; bundling; twisting; doubling; spooling; warping, etc.; calculations and information regarding each process.

SLASHING.—The slasher, construction and use; necessity for slashing; creel, cylinders, size box, etc.; mixing of size; different sizing ingredients for special purposes; methods of preparing warps for the slasher.

Weaving.

DESIGNING.—Principles generally used in the formation of weaves; design paper and the method of representing weaves on same; explanation of warp and filling; the plain, or cotton weave; twill weaves, satin weaves and method of construction; foundation weave derived from plain weaves; rib weaves, basket weaves; weaves derived from twills and broken twills; steep or diagonal,
skip, reclining and curve twills; combination steep twills, cork-screw twills, entwining twills; twills producing checker-board effects, pointed twills; the method of making drawing-in drafts, chain drafts; methods used in reducing weaves to the lowest number of harness; plain and fancy drafts—point, skip, mixed or crossed draws; rules for finding number of heddles required for each harness; fancy effects produced with the plain weaves using colored warp and filling; effects produced by using two or more colors on ribs and basket weaves; weaves derived from satins, shading of satin weaves, figured effects produced by using warp and filling satins; honey-comb weaves; imitation gauze weaves; fabrics constructed by combining weaves with one system of warp and two systems of filling; figuring with two warps and one filling; double cloth, construction of double cloth weaves, methods of indicating them on design paper, stitching of double cloth weaves to give figured effects, the double plain weave to give reversible figured effects; weaves for special fabrics—Bedford cords, pique, matellesse.

JACQUARD DESIGNING.—Explanation of the Jacquard machine; Jacquard harness, tying up of the harness,—the straight through, center, French and English systems of tying up; the single and double lift Jacquard, the single and double cylinder machine; the open and closed shed machine explained; method of laying out patterns for Jacquard designs, size of sketch required; enlarging and reducing figures from sketches; comb board and method of figuring texture for same; casting out of hooks to reduce texture of goods; card cutting, lacing and wiring.

CLOTH ANALYSIS.—Methods used for arranging cloth for analysis; figuring the size of cotton, woolen, worsted and silk yarns; calculations for converting one system of yarns into that of another; finding the weights, counts, etc., from the analysis; reed calculations.

This work takes up all classes of weaves that can be woven on harness, and gives the student a thorough knowledge of figuring yarns, weights, ends, picks per inch, etc. The results obtained in this manner are very instructive, as they show the good and the bad qualities of the various weaves and color effects.

POWER LOOM WEAVING.—Construction of the plain loom; various shedding motions; open shed machine; side cam loom, setting the cams; pick motion, methods of picking; take-up and let-off motions; box motion, drop box, skip box, timing and setting box motion; the dobbey and its uses, pattern chains for single and double index dobbies, setting and timing of the dobbey; leno
motion and setting of the same; douh harness and setting of same; Jacquard loom analyzed and explained.

Building and Equipment.

The building is a capacious, two-story, brick structure, and although designed specially for educational and experimental work, yet retains the more prominent features of a modern mill.

The building is well equipped with complete systems of electric lighting, steam heating, humidifiers, shafting, automatic sprinklers, etc., all of which are installed in the most approved manner, from plans furnished by experienced mill engineers.

The equipment consists of:

The Aerophor Co.'s system of "Vortex" humidifiers. The equipment of automatic fire sprinklers from the D. A. Tompkins Co., Charlotte, N. C.

The steam heating system from the D. A. Tompkins Co., Charlotte, N. C.


Carding Department.

PICKERS.—
One Atherton Automatic Feeder; one Atherton Combination Breaker and Finisher, Lapper, with evener motion.

CORDS.—
One Saco and Pettee 40-in. Revolving Flat Card; one Mason 40-in. Revolving Flat Card; one Entwistle Traverse Wheel Grinder; two Entwistle Drum Grinders; Stripping and Burnishing Rolls; complete set Carder’s Tools.

COMBING.—
One Silver Lap Machine; one Ribbon Lapper; one Combing Machine. (To be selected).

RAILWAY HEADS.—
One Saco and Pettee Railway Head, with evening motion, stop motion, and metallic rolls; one Mason Railway Head, with evening motion, stop motion, and metallic rolls.

DRAWING.—
One Saco and Pettee Drawing Frame, 4 deliveries, stop motion, and Metallic Rolls; one Mason Drawing Frame, 4 deliveries, stop motion, and metallic rolls.

FLY FRAMES.—
One Saco and Pettee 40 Spindle Slubber, with latest improved differential motion; one Saco and Pettee 60 Spindle Intermediate Roving Frame, with latest improved differential motion; one Saco and Pettee 80 Spindle Fine Roving Frame, with latest improved differential motion.

Spinning Department.

RING SPINNING.—
One Saco and Pettee Combination Warp and Filling Ring Spinning Frame, 128 Spindles; one Mason Combination Warp and Filling Ring Spinning Frame, 112 Spindles.

MULE SPINNING.—
One Mason Spinning Mule, 120 Spindles, 1¾” gauge, with all latest improvements.
SPOOLING.—
One Draper Spooler, 40 Spindles; one Saco and Pettee Spooler, 72 Spindles.

TWISTING.—
One Draper Combination Wet and Dry Twister, 48 Spindles.

WINDING.—
One Schaum & Uhrlinger Bobbin Winder; one Atwood-Morrison Co. Winder.

REELING.—
One D. A. Tompkins Co. 50 Spindle Adjustable Reel.

WARPING.—
One Draper Beaming Machine.

Weaving Department.

HAND LOOMS.—
Hand Loom Weave Room fully equipped with 4x4 box looms, fitted with 30 Harness Shedding Engines for fancy Cottons. Also Drawing-in Frames, Warping Frames, Beaming Frames, etc.

POWER LOOMS.—
One 28-in. Northrop Loom, with warp stop motion and automatic filling magazine; one 40-in. Northrop Loom, with cams for weaving up to 5 harness fabrics; one Mason 4x1 Drop Box Loom, with Stafford 20 Harness Dobby; one Mason 40-in. Loom, with Stafford 20 Harness Dobby; one Mason 24 Harness Dobby Loom; one Stafford 20 Harness Loom, with Leno attachment; one Stafford Dress Goods Loom, with Stafford 400 hook, single lift, swing cylinder, Jacquard. More looms will be added as soon as they can be delivered by the makers.

JACQUARD CARD CUTTING.—
One Jno. Royle French Index Foot Power Card Cutter; three Card Lacing Frames.

Donations.
The following donations are acknowledged with thanks
The A. T. Atherton Machine Co., Pawtucket, R. I.—One Automatic Feeder; one Combination Breaker and Finisher Lapper; one lot of Lap Rods.
Saco & Pettee Machine Co., Newton Upper Falls, Mass.—One 40-in. Revolving Top Flat Card; one Entwistle Traverse Grinder; one Entwistle Drum Grinder; one Burnisher; one set Carder's Tools; one improved Railway Head, with back, front and full can stop motion; one 4 Delivery Draw Frame with back, front and full can stop motion, fitted with single preventer rolls; one 40 Spindle Slubber; one 60 Spindle Intermediate Roving Frame; one 80 Spindle Fine Roving Frame; one 128 Spindle Combination Warp and Filling Ring Spinning Frame; one 72 Spindle Improved Spooler. A sufficient number of gears were sent with these machines to make various changes that may be necessary.
Mason Machine Works, Taunton, Mass.—One 40-in. Revolving Top Flat Card; one Entwistle Drum Grinder; one Stripper Brush; one set Carders' Tools; one Railway Head, with back, front and full can stop motion; one 4 Delivery Draw Frame, with back, front and full can stop motion, fitted with single preventer roll; one 112 Spindle Combination Warp and Filling Ring Spinning Frame; one 40-in. Plain Loom; one 36-in. Fancy Cotton Loom; one 36-in. 24 Harness Dobby Loom. All necessary gears with these machines to make the required changes.
The D. A. Tompkins Co., Charlotte, N. C.—One Adjustable Reel; one
CLEMSON COLLEGE.

Draw-in Frame; one Loom Box; one Doffer Box; two Section Beams; one Switch Board, complete.
Draper Co., Hopedale, Mass.—One 40 in. Northrop Loom; one 28 in. Northrop Loom; one 48 Spindle Combination Wet and Dry Twister; one 40 Spindle Spooler; one Warper, with Creel; four Section Beams; Temples as required; Loom Findings.
Schaum & Uhringer, Philadelphia, Pa.—One Top Engine Drive, self-balancing, hydro-extractor; one Bobbin Winder.
The Metallic Drawing Roll Co., Indian Orchard, Mass.—Metallic Drawing Rolls for Railway Heads and Draw Frames as required.
The Aerophor Co., Boston, Mass.—Complete system of "Vortex" Humidifiers, including pump, tank and connections.
Crompton & Knowles Loom Works, Worcester, Mass.—Reduction of one half on price of looms.
New Bedford Paper Co., New Bedford, Mass.—Caps, Cones, Tubes, etc., as required.
Charlotte Supply Co., Charlotte, N. C.—All belting as required.
American Supply Co., Providence, R. I.—Heddles, Heddle Frames, Reeds and Loom Supplies as required.
Loom Picker Co., Biddeford, Me.—Loom Supplies.
The Emmons Loom Harness Co.—Cotton Harness, Reeds and Loom Supplies.
Sykes & Street, New York, N. Y.—Collection of Dye Stuffs.
Wm. Pinkhardt & Kutroff—Collection of Dye Stuffs.
The school is well equipped with reels, yarn testers, analytical balances, and all necessary instruments for experimental purposes.
CLEMSON COLLEGE.

TYPE OF ENTRANCE EXAMINATION FOR FRESHMAN CLASS.

Algebra.

I. Simplify: 
\[(a - b + c)^2 - \{a (c - a - b) - [b (a + b + c) - c (a - b - c)]\} .\]

II. Resolve into binomial factors: 
\[ (x - y) (x^2 - y^2) - (x - y) (x^2 - y^2) .\]

III. Multiply: 
\[ a^{2m} - a^m y^n + y^{2m} \text{ by } a^m + y^m .\]

IV. Simplify: 
\[ \left[ \frac{m + n}{m - n} + \frac{m^2 + n^2}{m^2 - n^2} \right] + \left[ \frac{m - n}{m + n} - \frac{m^2 + n^2}{m^2 - n^2} \right] .\]

V. Prove: 
\[ \frac{1}{x + 1} - \frac{2}{(x + 2)(x + 1)} = 1 .\]

VI. Solve: 
\[ \frac{4}{x - 8} + \frac{3}{2x - 16} - \frac{29}{24} = \frac{2}{3x - 24} .\]

VII. In going from Boston to Portland, a passenger train at 27 miles per hour occupies 2 hours less than a freight train at 18 miles per hour. Find the distance from Boston to Portland.

VIII. Solve for \(x\) and \(y\): 
\[ \begin{cases} \frac{3x - 5y}{2} + 3 = \frac{2x + y}{5} \\ 8 - \frac{x - 2y}{4} = \frac{x}{2} + \frac{y}{3} \end{cases} \]

IX. What is the square root of: 
\[ 4a^4b^2 + 8a^3b^3 - 12a^3b^2 + 9a^2b^2 - 12a^2b^3 + 4a^2b^4? \]

X. Solve: 
\[ \frac{3}{8} (3x^2 - x - 5) - \frac{1}{8} (x^2 - 1) = 2(x - 2)^2 .\]
I. If \( f(x) = \sin x + \cos x \), prove that \( \sqrt{2} \) is a maximum of \( f(x) \).

II. A window consists of a rectangle surmounted by a semi-circle. Its perimeter is \( 2a \). Prove that the quantity of light admitted is a maximum when the height of the rectangle is equal to the radius of the semi-circle.

III. Prove: \( \int \frac{x^5 + x^4 - 8}{x^3 - 4x} \, dx = \frac{x^3}{3} + \frac{x^2}{2} + 4x + \log \frac{x^2(x-2)^5}{(x+2)^3} \)

IV. \( \int_1^x \frac{(2x-5) \, dx}{(x+3)(x+1)^2} = \frac{7}{2(x+1)} + \frac{3}{4} \log \frac{2(x+1)}{x+3} - \frac{3}{4} \).

V. \( \int x^3 a^x \, dx = \frac{a^x}{\log a} \left[ x^3 - \frac{3x^2}{\log a} + \frac{6x}{\log a} - \frac{6}{\log a} \right] \)

VI. \( \int \tan x \sec x \, dx = \frac{\tan^2 x}{2} - \frac{\sec x}{2} + \frac{\sec x}{2} \)

VII. \( \int \sin^2 x \cos x \, dx = \frac{1}{8} \left[ -\frac{\sin^3 2x}{3} + x - \frac{\sin 4x}{4} \right] \)

VIII. Derive formulas of integration for: (a) Lengths of curves. (b) Areas of surfaces of revolution.

IX. Expand in series and find value to four places of \( \int e^{ax} \, dx \)

X. Prove: \( \int_0^{2a} \int_0^x \int_y^x x \, y \, z \, dx \, dy \, dz = \frac{21a^6}{16} \)
I. In the manufacture of acid phosphates from phosphate rock, free phosphoric acid, mono-calcium phosphate and di-calcium phosphate may be formed. Write equations expressing the reactions in each case and state the reaction especially desired in the manufacture of fertilizers.

II. Write equation expressing the formation of "reverted" phosphate when the reversion is due to the presence of undecomposed phosphate rock in the acid phosphate.

III. How would you determine the proportion of chamber acid necessary for the proper manufacture of an acid phosphate from a given phosphate rock?

IV. What change does the soluble phosphate undergo when an acid phosphate is applied to the soil? Why is the phosphoric acid of acid phosphates not liable to be washed out of the soil and why is the action of a freshly applied acid phosphate more marked than that of the residue left in the soil from an acid phosphate applied a previous year?

V. Mention some animal and vegetable manures used as sources of nitrogen. State the approximate percentage of nitrogen in each and calculate the equivalent percentage of ammonia.

VI. Calculate the per cent. of potassium in pure potassium chloride. To what per cent. of potash (K₂O) is this equivalent? What is the usual guarantee of commercial muriate of potash?

VII. Into what three groups may food of animal origin be divided? What additional group is there in foods of vegetable origin?

VIII. Find the nutritive ratio of a food from the following data:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Digestion</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>12.3</td>
<td>55</td>
</tr>
<tr>
<td>Fibre</td>
<td>24.8</td>
<td>40</td>
</tr>
<tr>
<td>Nitrogen—free extract</td>
<td>38.1</td>
<td>64</td>
</tr>
<tr>
<td>Fat</td>
<td>3.3</td>
<td>53</td>
</tr>
</tbody>
</table>

IX. What is the average composition of cow’s milk? Which constituent is the most variable?

X. How does butter differ in composition from oleomargarine?
fects upon the physical condition of the soil. How, and through what agencies, does it affect the chemical constituents in the soil?

III. What do you understand by “soil mulch”? Explain its influence upon soil moisture.

IV. Name the three most important elements of plant food. Name the principal commercial sources of each. Mention some important legumes. What do they do for the soil? How used?

V. How do plants grow? Explain the uses of the different parts in the economy of the plant. How do plants reproduce? How do the essential organs of reproduction occur in different plants? Give examples.

VI. Discuss the protection and improvement of worn hill lands. Describe the best means used for their protection. How are they most economically improved?

VII. Tell how to provide fresh, green food for stock throughout the year by a combination of pasturage and green soiling crops. Tell what crops you would use at different seasons and how to grow them.

VIII. What is meant by the “free water” of the soil? How may it be removed? Tell how its removal benefits the soil.

IX. Discuss plant breeding for the purpose of improving the quality and increasing the quantity of production. Explain the difference between a cross and a hybrid.

AGRICULTURAL JUNIOR CLASS.

Final Examination in Plant Diseases June 1, 1900.

MR. ROLFS.

I. Give complete discussion of:
   (a). Bordeaux mixture, its preparation and use.
   (b). Hydrocyanic acid gas, its use and its limitation (Include lecture)

II. Write an essay of 200 words (a) on the use of technical terms and (b) state your objections to their use.

III. (a). Name and describe the nine divisions under which our author discussed fungi.
   (b) Give the best general “preventative means” for each division.


AGRICULTURAL SENIOR EXAMINATION.  STOCK FEEDING.

June, 1900.

ASSISTANT PROFESSOR CONNER.

1. a By what is the protein consumption in the body measured?
   b What influence has the feeding of fat and carbohydrates on the protein consumption?
   c What is the effect of feeding protein alone?
   d What is the influence of salt on protein consumption?
   e From what is fat formed in the body?

2. a Of what does the increase consist in fattening?
   b What per cent. of the food is used by the steer to put on fat?
   c Explain "wide and narrow ratio."
   d Where may each be used to advantage?
   e Explain method of calculating ratio.

3. a Give feeding value of corn to steers.
   b What is the feeding value of the corn cob?
   c When may wheat be fed in the place of corn?
   d Why is it best to feed a horse on oats?
   e Give the value of C. S. meal and linseed meal as a food for stock.

4. a At what stage would you cut corn, sorghum and cow pea vines for forage?
   b How does loss occur in saving forage by field curing and in the silo?
   c What effect has rain or dew on partly cured hay?
   d Name and give value of some of our grasses and legumes valuable for hay and pasture in the South.

5. a What does oat straw furnish when used as a stock food?
   b Give the advantages of soiling.
   c When does it pay to cook or soak food for stock?
   d Does it pay to grind grain for hogs?

6. a Why does silage increase the milk flow?
   b What gives value as a fertilizer to manure?
   c How much work will a horse do in 10 hours walking 3 miles per hour drawing 75 pounds?

7. a Should grain be fed to steers on pasture?
   b Why is not shelter as necessary for fattening stock as for milch cows?
   c How often should beef cattle be fed?
   d What is the value of breed in beef making?

8. a Can the per cent. of fat in the milk be changed by feeding?
   b What per cent. of the food is changed into milk and butter fat by the cow?

9. a What is the feeding value of skim milk when fed to hogs?
   b What other kind of food should be fed with skim milk?
   c What gives feeding value to whey?
10. a Which of the three, sheep, swine or cattle eat most per 100 pounds, live weight?
b Which require most per 100 pounds gain?

JUNIOR ENTOMOLOGY. FINAL EXAMINATION—JUNE 4, 1900.

MR. ROLFS.

I. A. Name and define orders studied this term.
   B. Give general method of treating noxious and beneficial species of each order.

II. A. Upon what characters does our author separate the Lepidoptera into sub-orders?
   B. Define the divisions usually used by elementary students.


IV. A. Mosquitoes—1. To what family do they belong; 2. Life-cycle; 3. How separated from allied families?
   B. Hessian-fly—1. Its technical name; 2. A full general discussion.

   B. General discussion of tachina flies; 2. Why did we omit some of the most important Diptera or study only briefly?


VII. A. Ground Beetles (Carabidae)—1. Essential characters; 2. Name some important species.
   B. Water-scavenger beetles (Hydrophylidae)—Give life-cycle.
   C. Carrion-beetles (Silphidae)—1. General discussion; 2. Important species.

   B. Name noxious species in above families and directions for combating them.
   C. Name beneficial species and give directions for propagating them.

IX. Hymenoptera—Name five noxious species, give their life-history and tell how to combat them.

X. Hymenoptera—Name five beneficial species, give their life-history and best methods of propagating them.

SENIOR MECHANICAL ENGINEERING.

PROFESSOR BOEHM.

1. Compute the width of a single leather belt to transmit 10 H. P. on 24 in. pulleys making 400 R. P. M.
2. How many 1-2 inch hemp ropes will be required to transmit 10 H. P. on 24 inch pulleys having 45 deg. grooves and making 400 R. P. M.

3. The tensions on the tight and slack sides of the belt running on a 10 foot pulley making 150 revolutions per min. are 2,000 and 1,000 pounds respectively. The pulley weighs 4,000 pounds and runs loose on a 6 inch shaft, coefficient of friction being .06. What is the efficiency of transmission?

4. A 4 inch vertical shaft having a 60 deg. pivot bearing, weighs with pulleys 2,000 pounds and transmits 20 H. P. at 100 R. P. M. If the coefficient of friction be .06 what will be the H. P. loss?

5. What is the maximum allowable steam pressure for a 50"x16" horizontal tubular boiler, having double rivetted side seams and 60,000 pound steel plates 1-4 inch thick?

6. The formula for belting shows at a glance that the greater the belt speed the greater will be the power that can be transmitted by a given width of belt. Economy in the purchase of belting therefore demands that the rim speed be run up to the limit wherever practicable. If, however, the belt speed, which is also the rim speed of the pulley, be excessive, the centrifugal force may disrupt the pulley and endanger loss of life and property. Now good practice borne out by sound theory has fixed a mile a minute as the limit of rim speed for cast iron pulleys and engine flywheels, are usually run at that speed.

With these facts in mind what diameter and face of pulley would you recommend for an 18"x24" engine designed to develop 100 H. P. at 600 feet of piston speed per minute?

8. What angle would you recommend for the cone in the clutch pulley per sketch, the engaging surfaces being smooth cast iron having a coefficient of friction of .06?

9. A 10x12 engine develops 15 H. P. at 200 revolutions. The fly wheel is 6 feet in diameter and governor driving and driven pulleys each 6 inches dia. This engine is not developing sufficient power for its present work and it is desired to increase its power 50 per cent. if possible, without increasing the steam pressure. If this can be done without an infringement of what is usually termed good practice, please give specific directions for the changes you would suggest to accomplish the ends desired.

SENIOR EXAMINATION MECHANICAL ENGINEERING.

Second Term, 1900.

PROFESSOR BOEHM.

1. Ice and Refrigerating Machinery.—Upon what general law of thermodynamics does mechanical refrigeration depend? Make a free-hand sketch
illustrating the process of making manufactured ice, and showing the general arrangement of all the machinery required; as boiler, engine, ammonia-compressor, condenser, etc.

Manufacturing Plants.—State some of the conditions that must be investigated by the consulting engineer in determining whether a proposed manufacturing plant is likely to prove a financial success. Take, for example, a proposed cotton factory or a city lighting plant.

3. Contracts and Specifications.—Name the four essential elements of a legal contract. What are the two general classes of contracts? What is implied by the fixing of a (Seal) to a legal document? State some of the essential elements of a clear specification for engineering works. What relation does the engineer occupy to the owner and contractor in such work—that is does he occupy a partisan or a judicial position? What should be the nature of his decisions in case of controversy?

SENIOR APPLIED MECHANICS—SECOND TERM, 1900.

PROFESSOR BOEHM.

1. Compute the load that may be safely sustained by a 6''x6''x10' yellow pine post having a safe crushing strength of 1,200 pounds per square inch.

2. Determine the size and sketch the shape of a mild steel lever to exert a force of 135 pounds on one end by application of 45 pounds on other end. Lever to have no surplus material whatever in its construction to be 12'' long over all and depth at fulcrum to be 6 times width, width to be uniform throughout.

3. A standard locomotive has its weight so distributed that the load on each driver is 12,000 pounds and on each truck wheel 6,000 pounds, distance between drivers being 8' and between truck wheel and nearest driver 6'. What size steel I beam will be required to safely sustain this load on a 30 foot span?

4. Determine the amount and character of the stress in each of the members of the roof truss per sketch. Make sketch of truss in which tension members are indicated by thin lines, compression members by thick lines, and mark the stress in pounds on each member.

5. The 90 foot Warren bridge truss per sketch is composed of equilateral triangles and is to carry loads of 8,000 pounds at the panel points. Show method of making strain diagram to determine graphically the amount and character of stress for which each member must be designed. Make sketch of truss and indicate tension members by thin lines, compression members by thick lines, and members having no stress by dotted lines.

SENIOR EXAMINATION—HYDRAULICS—SECOND TERM, 1900.

PROFESSOR BOEHM.

1. A circular tank 30 ft. dia. and 10 ft. high has a pipe 8 in. dia. and 115 ft. high opening into its upper surface. An ordinary pressure gage (read-
ing pounds above atmosphere) is tapped into the side of the tank at its middle, gage being 60 ft. above that point and also 60 ft. below surface of water in pipe. How many pounds pressure does gage indicate?

2. A rigid gate between the head and tail waters of a flume, has a circular plate 1 ft. dia. submerged 3 ft. below the surface of tail water. When the difference in water levels is 2 ft. what is the total pressure in pounds with which this plate is held against the gate?

3. The upper and lower edges of a 2 ft. by 1 ft. rectangular plate are respectively 3 ft. and 4 ft. below the surface of the water in the tank, per sketch. What force in pounds at lever handle will be required to lift plate, leverage being 10 to 1?

4. Compute the number of cu. ft. of water flowing per min. through a rectangular weir notch 2 ft. in width, when there is a head of 1 ft. measured well back of crest.

5-6. By actual measurement the average depth and width of a stream are 4 ft. and 30 ft. respectively. A chip thrown into midstream was carried by the current over a measured course of 100 ft. in 1-2 minute, and if this stream be developed for power purposes a fall of 20 ft. can be secured. Assuming mean velocity of stream to be 85 per cent. of velocity of float in mid-stream and efficiency of good water wheels to be 80 per cent. under a head of 20 ft., what horse power would be available at pulley of water wheel?

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**JUNIOR CLASS—SECOND TERM.**

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**Examination in Electrical Engineering, June 7, 1900.**

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**MR. RIGGS.**

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1. (a) Show that the heat loss in a conductor of resistance $R$, carrying a current of $C$ amperes is $C^2R$; (b) Prove that a mechanical horse power is 746 watts.

2. Briefly outline the construction and operation (a) of an open arc lamp; (b) of an enclosed arc lamp; (c) of an incandescent lamp; (d) give practical rule for connecting arc light carbons properly in the circuit.

3. Explain fully the generation of E.M.F. in a dynamo, describing the essential parts of the machine, and explaining fully the function and operation of the commutator.

4. Explain fully the operation of an electric motor; the generation of C. E. M. F. in the armature of the motor and the effects.

5. (a) Explain three methods of exciting the fields of dynamos. (b) Define the following terms:—Electrical, gross, and net eff.

6. 125-10 amp. 2000 (nominal) c. p. open arc lamps requiring each 450 watts are placed in a series circuit of No. 8 B. & S. wire 5000 feet around; Armature resistance = 1 ohm; series field $R = 2$ ohms. Find: (1) Necessary p. d. at generator terminals; (2) E. M. F. of generator; (3) Eff. of line trans; (4) Electrical eff. of generator; (5) Electrical eff. of line and generator together.

7. 508-20 c. p. 3.2 watts—108.3 volts incandescent lamps are situated in barracks, which is 590 ft. distant from the power station. The maximum allowable loss in trans. is 5 per cent. Find: (1) nearest size (or sizes) B. & S. wire that should be used; (2) with this wire the necessary p. d. at the generator terminals; (3) Eff. of trans. attained.
8. A shunt generator furnishes to a bank of incandescent lamps 300 amp. at 120 volts. Mechanical losses in generator = 1 H. P.; iron losses in arm. core 1-2 K. W.; Arm. R. = 01 ohm; shunt field R. = 30 ohms. Find: (1) Net eff.; (2) Elec. eff.; (3) Necessary H. P. that must be applied to generator pulley; (4) Net eff. of generator at an output of 50 amp.

9. A shunt motor is supplied with 102 amp. at 500 volts. Motor's iron losses = 200 watts; mechanical losses = 1-2 H. P.; Arm. R. = 1 ohm; shunt field R. = 250 ohms. Find: (1) C. E. M. F.; (2) Net eff. of motor; (3) H. P. at motor pulley.

10. Find the relative cost of copper for trans. 500 K. W. with a limiting loss of 10 per cent., a distance of 5000 ft., copper being worth $0.20 per lb. (use nearest size or sizes B. & S.), (1) at 10,000 volts; (2) at 5,000 volts; (3) at 1,000 volts.

11. The Textile School motor is rated at 30 H. P. —220 volts—85 per cent. net eff. Its distance from the power plant is 1,000 ft. The line for one-half this distance is composed of two No. 1 B. & S. wires in parallel, the other half of the line is of a single No. 0000 B. & S. wire. Find: (1) line drop; (2) p. d. at generator terminals.

12. It costs in the Clemson power plant about $0.05 per K. W. hour, to produce power. The pumping station is situated 2,500 ft. from the plant, and the motor therein is connected to the plant by a No. 0000 B. & S. wire. The switch board instruments show that the motor line is furnished with 50 amp. at 230 volts, for about 8 hours per day for 300 days of the year. Would it pay the college to borrow money at 7 per cent. interest and run an additional No. 0000 B. & S. wire in parallel with the first in order to reduce the line losses, copper being worth $0.20 per lb., and the additional line construction, say $50.00 per thousand feet of distance?

EXAMINATION SENIOR CLASS, SECOND TERM—ELECTRICAL ENGINEERING—MAY 29, 1900.

Alternating Currents.

MR. RIGGS.

1. Find the self induction of a ring shaped solenoid whose mean diameter is 8 cms., area is 2 sq. cms., wound with 4,000 turns, and traversed by an A. C. whose maximum value is 42.43 amperes. (2) If an iron core whose working permeability is 250 be inserted find L.

2. A series circuit between whose terminals a p. d. of 3100 volts exists, is made up of the following parts—a non-inductive resistance A of 10 ohms, a non-inductive resistance B of 5 ohms, a transformer's primary C whose R. = 7 ohms, and L = 0.04 henry, and a condenser D whose capacity is 125 M. F.

Find: (1) Current flowing and the phase angle; (2) Drop in parts A, B, C and D; (3) p. d. necessary to cause current of 125 amps.; (4) What capacity must be inserted at D to allow a current—p.d-R to flow?

3. Four branches, A, B, C and D, in multiple are connected to a 1000 volt generator by a line whose R = 6 ohms L = 0.02 henry, K = 125 M. F.
Clemson College.

Branch A has a $R = 0, L = 0.0125$.
Branch B has a $R = 5, K = 250$ M. F.,
Branch C has a $R = 8, L = 0.9$.
Branch D has a $R = 0, K = 125$.

Find: (1) Current and phase angle for circuit as a whole; (2) Current and phase angle for circuits A, B, C and D.

4. We desire to transmit 90 K. W. at 60 cycles 5000 volts a distance of two miles with an energy loss not to exceed 10 per cent.; power factor of the circuit 90 per cent., wires to be stretched 18 in. between centres. Find: (1) Nearest B. & S. wire; (2) Ohmic and inductive drop in the line; (3) P. D. at terminal of the load; (4) Efficiency of transmission.

5. Transformers. Explain the action of a transformer, (1) with secondary open, (2) with secondary loaded. (3) What is meant by the exciting and magnetizing current of a trans.? (4) What is meant by the “ageing” of trans., the cause and remedy? (5) State relative advantages and disadvantages of open and close magnetic circuit trans. (6) What causes poor voltage regulation at secondary terminals?

6. A 5 K. W. transformer has the following net Effs.: At full load 95 per cent.; at 3-4 load 94 per cent.; at 1-2 load 92 per cent.; at 1-4 load 90 per cent. Iron losses at all loads 75 watts, and heat loss in primary due to exciting current when secondary is open 5 watts. This trans. is operated for 5 hours at full load, 5 hours at 3-4 load, 2 hours at 1-2 load, 2 hours at 1-4 load, and the remaining hours of the 24 at no load. Find its all day efficiency.

7. It is desired to transform from 10,000 volts, 3 phase, to 1,000 volts 2 phase by the means of a Scott-connected trans. Given: the number of turns on one of the three phase primaries; viz., $S=1000$ turns. Find $S', S'', S'''$; and prove that the windings are properly proportioned.

8. Alternators in parallel. Show how connected, and how they tend to keep each other in opposition of phase. (2) Diagram and explain some method of synchronizing alternators. (3) Explain fully the operation of a synchronous motor, showing how it can take current to meet its load demands while operating at a constant speed and excitation.

9. An alternator supplies to a synchronous motor current at 1000 volts pressure, frequency 127.5. The motor’s excitation is adjusted to give 1000 volts. R of the line and motor armature is 4 ohms, L of the same is .005 henry. Find: (1) relative position of e and E when a current of 100 ampere flows in the motor armature; (2) angle between C and e and E; (3) with a constant load of CE cos 0.2, what value of E will make power factor of the circuit unity?

10. Induction Motor. Explain in general the principle of the rotating magnetic field, and polyphase induction motor, briefly outlining its construction and connections.

11. In the following induction motors the full load slip is 5 per cent. Find the rotative speed at full load, the frequency of the A. C. being 60 cycles.

(1) two phase—total number of field coils 24;
(2) three phase—total number of field coils 24;
(3) three phase—“four pole;”
(4) two phase—“eight pole.”

12. (1) In the 3 phase mesh connected system, if current in each armature circuit=100 amp. and E. M. F. generated=1000 volts (neglecting armature drop), find current in lines, and p. d. between any two lines. (2) In the 3 phase Y connected system the line current per phase=100 amp.; the p. d. between any two lines=3464 volts. Find current and E. M. F. of each armature circuit. (3) In the two phase 3 wire system the current in the common wire is 282 amps., and the p. d. between the outside lines is 14,142 volts. Find current and E. M. F. of each armature circuit.
EXAMINATION SENIOR CIVIL ENGINEERING—JUNE, 1900.

PROFESSOR BRODIE.

Bridge Engineering.—A through Pratt, single track, railroad bridge with span of 144 feet, has six panels and a depth of 26.9 feet. It is designed to carry a live load of two coupled, consolidation locomotives, 139 tons each, followed by 1.6 tons per lineal foot of train load. (Weights and spacing of wheels as shown on diagram).

Compute maximum live load stress in:

I. First diagonal.
II. First panel of lower chord.
III. Third diagonal.
IV. Second vertical.
V. Counter diagonal in third panel.

Compute for uniform live load of 44 tons per panel per truss:

VI. Second diagonal.
VII. Counter in second panel.
VIII. First vertical.

IX. Find the uniform load per linear foot that will cause the same maximum binding moment in a beam of 20 ft. span as the drivers of a passenger locomotive, each weighing 40,000 pounds, and 8 feet apart.

X. Prove that for maximum moment from wheel loads \( F' = n' \cdot m \cdot W \), or that the weights on the segments of the span are proportional to the lengths of the segments.

EXAMINATION IN TEXTILE INDUSTRY—JUNIOR SECTION.

PROFESSOR BEATY.

I. A. What is the draft of a machine with following gears: 33 T. F. R. G., 56 T. B. R. G., 1 1-4 in. F. R., 1 in. B. R., 100 T. Crown Gear, 56 T. Draft Gear, and what would be the weight in grains of 12 yds. on the front of this machine, if a single roving No. 8 Hank be used behind the machine?

B. What would be the weight of 1 yd. of finished drawing suitable to make 40-1 yarn with following drafts and doublings: Spinning from, draft 10, doublings 2; fine roving frame, draft 6, doublings 2; intermediate roving frame, draft 5 1-2, doublings 2; slubber, draft 4?

II. A. What is the effect on the resultant yarn if there be too few doublings, or if it is "overdrafted"?

B. What is the theory of doubling in the various processes of manufacture?

C. Name the most important reasons why it is impossible to make a perfect yarn?

III. A. If it were left to your judgment, would you use leather covered "shell rolls" or leather covered "solid rolls" over the front line of bottom steel rolls on spinning and roving frames? In your judgment which is preferable, leather covered top rolls or
metallic top rolls on drawing frames? State the reason for your answer in each of the above cases.

B. The railway-head is intended to automatically adjust its draft so that any irregularity in the weight of the sliver passing through the machine will be corrected. What is the practical error in its construction which prevents it from accomplishing the purpose for which it was designed?

IV. A. A manufacturer has 320 bobbins of 60-2 cotton yarn, each containing 8 oz. of yarn; allowing 5 per cent. for waste, what length warp (in yards), containing 3,600 ends could be made with above yarn?

B. In making a Grindell cord of red, white and blue cotton yarn, the red is No. 12-1, the white No. 15-1, what number must the blue yarn be to produce a 3-ply finished yarn No. 3?

V. A. Give a general description of a ring spinning frame.

B. Name the constituents of a good sizing compound to be used on white cloth, which is afterward to be bleached.

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TEXTILE DEPARTMENT—SENIOR CLASS.

Final Examination May 23, 1900.

MR. FRISSELL.

1. Make all necessary calculations for weaving a piece of cloth including width in reed, number of reed to use, size of yarn, length of warp to dress to give a 60-yard cut, cloth to be 37 in. finished, 72 reeds per inch, 36 picks per inch, 6 yards warp, weight 4.05 grains, 0.5 yards filling, weight 4.5 grains.

2. Find price to pay per cut for weaving the above pieces of cloth so as to allow the weaver to make 90c. per day of 10 hours, looms to run 164 picks, each weaver to run 6 looms. Allow the production to be 88 per cent.

3. Find number of ends in a 20s cotton warp 500 yards long, weight 80 pounds.

4. Find largest number of ends possible to use in making a 5 harness sateen with 28s cotton.

5. Find cost of making a piece of cotton dress goods, 27 inches wide finished, 56 ends per inch, 60 picks per inch; dressing of warp 6 ends cotton 26s, 2 ends cotton 18s; filling same as warp; allow 8 per cent. take up; cost of 26s 18c. per pound; cost of 18s 14c. per pound; general expenses $0.0035 per yard; cost of weaving 32c. per cut of 56 yards; allow 2 per cent. for waste.
## REGISTER OF STUDENTS--1899-00.

### Postgraduate Student.

Shealey, A. S. ........ Edgefield.

### Senior Class.

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<td>Hamilton, F. P.</td>
<td>Union</td>
<td>Wallace, J. M.</td>
<td>Union</td>
</tr>
<tr>
<td>Harrall, J. E.</td>
<td>Chesterfield</td>
<td>Walker, Chas. N.</td>
<td>Barnwell</td>
</tr>
<tr>
<td>Hartley, E. L.</td>
<td>Lexington</td>
<td>Wannamaker, J. G.</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>Harvey, T. M.</td>
<td>Charleston</td>
<td>Ward, J. LaB.</td>
<td>Georgetown</td>
</tr>
<tr>
<td>Haynsworth, R. B.</td>
<td>Florence</td>
<td>Watts, E. B. C.</td>
<td>Laurens</td>
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<tr>
<td>Hill, A. W.</td>
<td>Greenville</td>
<td>West, Chas. D.</td>
<td>Greenville</td>
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</table>
### Subfreshman Class B

<table>
<thead>
<tr>
<th>Name</th>
<th>County</th>
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<tbody>
<tr>
<td>Adams, F. L.</td>
<td>Pickens</td>
</tr>
<tr>
<td>Allen, L. M.</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Bamberg, H. F.</td>
<td>Bamberg</td>
</tr>
<tr>
<td>Barnwell, J. G.</td>
<td>Sumter</td>
</tr>
<tr>
<td>Barton, J. E., Jr.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Bell, L. H.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Boone, J. E.</td>
<td>Beaufort</td>
</tr>
<tr>
<td>Bowen, E. H.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Breese, R. H.</td>
<td>Beaufort, N. C.</td>
</tr>
<tr>
<td>Bryan, S. G.</td>
<td>Williamsburg</td>
</tr>
<tr>
<td>Caldwell, J. Y.</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Carrigan, J. R.</td>
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</tr>
<tr>
<td>Carter, A. H.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Carter, L. E.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Caughman, J. H.</td>
<td>Saluda</td>
</tr>
<tr>
<td>Chassereau, E. P.</td>
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<tr>
<td>Coker, L. S.</td>
<td>Darling</td>
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<tr>
<td>Coney, R. J.</td>
<td>Dorchester</td>
</tr>
<tr>
<td>Cooper, C. B.</td>
<td>Richland</td>
</tr>
<tr>
<td>Craft, B. E.</td>
<td>Lexington</td>
</tr>
<tr>
<td>Croft, L. E.</td>
<td>Aiken</td>
</tr>
<tr>
<td>Crouch, E. P.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Cromer, B. C.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Dial, R. T.</td>
<td>Richland</td>
</tr>
<tr>
<td>Dingle, F. R.</td>
<td>Clarendon</td>
</tr>
<tr>
<td>Dixon, D. M.</td>
<td>Chester</td>
</tr>
<tr>
<td>Donald, J. F.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Donaghey, N. M.</td>
<td>Grayson, Tex</td>
</tr>
<tr>
<td>Donley, W. H., Jr.</td>
<td>Lexington</td>
</tr>
<tr>
<td>DuBose, W. A.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Easterling, A. L.</td>
<td>Marlboro</td>
</tr>
<tr>
<td>Easterling, B. C.</td>
<td>Marlboro</td>
</tr>
<tr>
<td>Easterling, B. B.</td>
<td>Barnwell</td>
</tr>
<tr>
<td>Eldredge, I. F.</td>
<td>Kershaw</td>
</tr>
<tr>
<td>Evans, H. H., Jr.</td>
<td>Sumter</td>
</tr>
<tr>
<td>Faris, S., J.</td>
<td>York</td>
</tr>
<tr>
<td>Fletcher, D. B.</td>
<td>Gibson, N. C</td>
</tr>
<tr>
<td>Hogan, E. W.</td>
<td>Sumter</td>
</tr>
<tr>
<td>Houston, R. A.</td>
<td>Gonzales, Tex</td>
</tr>
<tr>
<td>Kearse, B. V.</td>
<td>Bamberg</td>
</tr>
<tr>
<td>Kearse, H. H.</td>
<td>Bamberg</td>
</tr>
<tr>
<td>King, L. H.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Krentzlin, J. J. A.</td>
<td>Richland</td>
</tr>
<tr>
<td>Lachicotte, F. W.</td>
<td>Georgetown</td>
</tr>
<tr>
<td>Loften, J. A.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Long, J. A.</td>
<td>Abbeville</td>
</tr>
<tr>
<td>Martin, D. R.</td>
<td>Fairfield</td>
</tr>
<tr>
<td>Maxwell, J.</td>
<td>Anderson</td>
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<tr>
<td>McCrary, F. G.</td>
<td>Laurens</td>
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<tr>
<td>McDavid, J. P.</td>
<td>Greenville</td>
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<tr>
<td>McDavid, R. I.</td>
<td>Greenville</td>
</tr>
<tr>
<td>McNelty, E. N.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Meriweather, J. C.</td>
<td>Hampton</td>
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<tr>
<td>Moore, M. W.</td>
<td>Marlboro</td>
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<tr>
<td>Moorehead, I. H., Jr.</td>
<td>Greenville</td>
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<tr>
<td>Muller, E. H.</td>
<td>Charleston</td>
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<tr>
<td>Owings, C. L.</td>
<td>Laurens</td>
</tr>
<tr>
<td>Oswald, K. F.</td>
<td>Lexington</td>
</tr>
<tr>
<td>Peggues, H.</td>
<td>Marlboro</td>
</tr>
<tr>
<td>Perry, F.</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Poat, E. R.</td>
<td>Richland</td>
</tr>
<tr>
<td>Pope, T. C.</td>
<td>Richland</td>
</tr>
<tr>
<td>Porter, J. C.</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>Purvis, E. O.</td>
<td>Florence</td>
</tr>
<tr>
<td>Reeves, M. S.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Richardson, J. H.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Shaw, J. L.</td>
<td>Barnwell</td>
</tr>
<tr>
<td>Sloan, F. P.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Smith, W. T.</td>
<td>Laurens</td>
</tr>
<tr>
<td>Steadman, G. A.</td>
<td>Bamberg</td>
</tr>
<tr>
<td>Stickley, J. W.</td>
<td>Beaufort</td>
</tr>
<tr>
<td>Stoddard, R. A.</td>
<td>Laurens</td>
</tr>
<tr>
<td>Stone, E. E.</td>
<td>Greenville</td>
</tr>
<tr>
<td>Stradley, H. E.</td>
<td>Greenville</td>
</tr>
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</table>
### Subfreshman Class A.

<table>
<thead>
<tr>
<th>Name</th>
<th>County</th>
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<tbody>
<tr>
<td>Auld, F. G.</td>
<td>Richland</td>
</tr>
<tr>
<td>Bissell, W. S.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Brown, Forrest</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Carter, C. V.</td>
<td>Lancaster</td>
</tr>
<tr>
<td>Causey, L. F.</td>
<td>Hampton</td>
</tr>
<tr>
<td>Chappell, J.</td>
<td>Richland</td>
</tr>
<tr>
<td>Croft, E. S.</td>
<td>Aiken</td>
</tr>
<tr>
<td>Ferrell, Z. E.</td>
<td>Williamsburg</td>
</tr>
<tr>
<td>Finklea, F. H.</td>
<td>Florence</td>
</tr>
<tr>
<td>Gibson, H. A.</td>
<td>Greenville</td>
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<tr>
<td>Gibson, J. E.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Gray, L. M.</td>
<td>Edgefield</td>
</tr>
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</table>

* Died March 14, 1900.

### Students in Irregular Courses.

<table>
<thead>
<tr>
<th>Name</th>
<th>County</th>
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</thead>
<tbody>
<tr>
<td>Chandler, S. J.</td>
<td>Florence</td>
</tr>
<tr>
<td>Cole, A. B.</td>
<td>Rockingham, N. C.</td>
</tr>
<tr>
<td>Gillespie, L. D.</td>
<td>Pickens</td>
</tr>
<tr>
<td>Hopkins, J. E.</td>
<td>Oconee</td>
</tr>
<tr>
<td>Hopkins, W. E.</td>
<td>Oconee</td>
</tr>
<tr>
<td>Homesley, A. B.</td>
<td>York</td>
</tr>
<tr>
<td>Johnston, O. H.</td>
<td>Anderson</td>
</tr>
<tr>
<td>MacMakin, J. W.</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Middleton, R. H.</td>
<td>Edgefield</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rutledge, T. P.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Sahlmann, H. C.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Sanders, A. H.</td>
<td>Kershaw</td>
</tr>
<tr>
<td>Shaw, T. C.</td>
<td>Abbeville</td>
</tr>
<tr>
<td>Slattery, J. I.</td>
<td>Greenville</td>
</tr>
<tr>
<td>Smith, E. E.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Stirling, J. C.</td>
<td>Pickens</td>
</tr>
<tr>
<td>Welborn, H. G.</td>
<td>Lexington</td>
</tr>
<tr>
<td>Wilson, J. M.</td>
<td>Union</td>
</tr>
</tbody>
</table>

### Summaries.

#### BY CLASSES.

- **Postgraduates**: 1
- **Seniors**: 28
- **Juniors**: 42
- **Sophomores**: 104
- **Freshmen**: 141
- **Subfreshmen B.**: 97
- **Subfreshmen A.**: 29
- **Irregular Students**: 18
- **Total**: 461

#### BY STATES.

- **South Carolina**: 440
- **Georgia**: 5
- **North Carolina**: 11
- **Virginia**: 2
- **Total**: 461

- **Tennessee**: 1
- **Texas**: 2

**Note:** The page contains a table listing names and counties of students in various classes, followed by summaries of students by classes and states. The page seems to be part of a college directory or enrollment report.
### Church Affiliation

<table>
<thead>
<tr>
<th>Church Affiliation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodist</td>
<td>132-32</td>
</tr>
<tr>
<td>Baptist</td>
<td>121-30</td>
</tr>
<tr>
<td>Presbyterian</td>
<td>53-13</td>
</tr>
<tr>
<td>Episcopal</td>
<td>58-15</td>
</tr>
<tr>
<td>Lutheran</td>
<td>14-3</td>
</tr>
<tr>
<td>Catholic</td>
<td>13-3</td>
</tr>
<tr>
<td>Associate Reform Presbyterian</td>
<td>7-1</td>
</tr>
<tr>
<td>Israelite</td>
<td>3-3-4</td>
</tr>
<tr>
<td>Christian</td>
<td>1-1-4</td>
</tr>
<tr>
<td>Unitarian</td>
<td>1-1-4</td>
</tr>
<tr>
<td>Universalist</td>
<td>1-1-4</td>
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</tbody>
</table>

The above numbers do not include 57 students who failed to furnish information as to church affiliation.

### Occupations of Parents

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>211-45</td>
</tr>
<tr>
<td>Merchants</td>
<td>60-13</td>
</tr>
<tr>
<td>Officers</td>
<td>21-4</td>
</tr>
<tr>
<td>Clerks</td>
<td>11-2</td>
</tr>
<tr>
<td>Manufacturers</td>
<td>6-1</td>
</tr>
<tr>
<td>Physicians</td>
<td>14-3</td>
</tr>
<tr>
<td>Lawyers</td>
<td>12-2</td>
</tr>
<tr>
<td>Ministers</td>
<td>8-1</td>
</tr>
<tr>
<td>Insurance Agents</td>
<td>3-3-4</td>
</tr>
<tr>
<td>Drummers</td>
<td>5-1</td>
</tr>
<tr>
<td>Millmen</td>
<td>9-2</td>
</tr>
<tr>
<td>Cotton Buyers</td>
<td>7-1</td>
</tr>
<tr>
<td>Railroad Men</td>
<td>7-1</td>
</tr>
<tr>
<td>Teachers</td>
<td>6-1</td>
</tr>
<tr>
<td>Butchers</td>
<td>5-1</td>
</tr>
<tr>
<td>Hotel-keepers</td>
<td>4-1</td>
</tr>
<tr>
<td>Book-keepers</td>
<td>4-1</td>
</tr>
<tr>
<td>Bank Officers</td>
<td>3-3-4</td>
</tr>
<tr>
<td>Lead Burners</td>
<td>3-3-4</td>
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<tr>
<td>Contractors</td>
<td>2-1-2</td>
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<tr>
<td>Dispensers</td>
<td>2-1-2</td>
</tr>
<tr>
<td>Machinists</td>
<td>2-1-2</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>56-12</td>
</tr>
</tbody>
</table>

Total: 461-100 per cent.
SECTION MARCHERS--FIRST TERM.

Senior Class.

Agricultural ......................... C. E. Mauldin and F. A. Lawton.

Junior Class.

Agricultural, 1st Sec ............... G. F. Klugh and C. J. Fickling.
Agricultural, 3d Sec ............... W. E. McLendon and C. W. Mauldin.
Mechanical, 2d Sec .................. W. A. Burgess and T. K. Glenn.

Sophomore Class.

Sec. 2 ............................... B. H. Barre and W. E. Chapman.
Sec. 4 ............................... F. M. Gunby and F. H. Gibbes.
Sec. 6 ............................... J. F. Moore and G. T. McGregor.
Sec. 8 ............................... E. M. Shealey and S. C. Stewart.
Agricultural ......................... F. K. Norris and J. M. Burgess.

Freshman Class.

Sec. 1 ............................... J. P. Cummings and W. W. Cobb.
Sec. 2 ............................... T. S. Gandy and J. P. Glenn.
Sec. 3 ............................... C. W. Legerton and J. F. Lanham.
Sec. 4 ............................... J. H. Woodward and A. E. Thomas.

Subfreshman B.

Sec. 1 ............................... R. J. Coney and J. E. Boone.
Sec. 2 ............................... A. M. Williams and J. L. Shaw.

Subfreshman A.

W. A. Coleman.

SECOND TERM.

E. Senior, Riggs and Sullivan.
T. Senior, Pearman and Donaldson.
1. Senior, All and Mauldin, C. E.
C. Senior, Liles and Adams.
1. Junior, Klugh and Hughes.
C. Junior, Burgess, W. A. and Chreitzberg.
T. Junior, Scott and Fair.
2. Sophomore, Barre and Cantey.
4. Sophomore, McGregor and Gunby.
T. Sophomore, Moore and Cothran.
1. Freshman, Bradford and Black.
2. Freshman, Gandy, T. S. and Harvey.
3. Freshman, Legerton and Sadler.
4. Freshman, Young and Woodward.
REGIMENTAL ORGANIZATION--JUNE, 1900.

For instruction in infantry tactics and military police and discipline, the cadets are organized into a regiment of two battalions of three companies each, under the Commandant of Cadets, each battalion being commanded by an instructor of the College detailed for this duty.

The officers and non-commissioned officers are selected from those cadets who have been most studious, soldier-like in the performance of their duties, and most exemplary in their general deportment. In general, the officers are taken from the Senior class, the sergeants from the Junior class, the corporals from the Sophomore class. The figures indicate relative rank.

COMMANDANT OF CADETS.
Major G. Shanklin..........................Acting.

COMMISSIONED STAFF.
J. F. Sullivan.................................Lieutenant and Adjutant.
W. D. George.................................Lieutenant and Quartermaster.

NON-COMMISSIONED STAFF.
P. H. All.....................................Sergeant-Major.
Q. B. Newman.................................Quartermaster-Sergeant.

FIRST BATTALION—MAJOR W. W. KLUGH.

CAPTAINS.
Company A. Company B. Company C.
J. E. Caughman(1), L. O. Mauldin(2), J. H. Kinsler(6),

LIEUTENANTS.
J. E. All(9), W. G. Adams(2), F. A. Lawton(5),
J. N. Walker(12), B. A. Fletcher (7), L. D. Clinkscales(11).

FIRST SERGEANTS.
J. C. Duckworth(3), J. E. Salley(5),

SERGEANTS.
R. G. Forsythe(3), E. H. Pickett(1), G. F. Klugh(6),
W. E. McLendon(9), W. M. Quattlebaum(22), J. H. Roddey(12),
J. W. Anderson(16), L. E. Connor(14), W. H. Scott(17),
W. R. Darlington(18),

CORPORALS.
B. H. Barre(7), G. T. McGregor(2), H. A. Wilson(3),
J. B. Whitney(12), F. H. Gibbes(6), F. M. Gunby(17),
E. M. Watson(16), E. M. Shealey(11), D. A. J. Sullivan(21),
W. D. King(20), D. Kohn(19), S. C. Stewart(28),
W. P. Hyams(26),
SECOND BATTALION—MAJOR S. M. MARTIN.

CAPTAINS.

Company D.
S. E. Liles(4),

Company E.
C. E. Mauldin(5),

Company F.
S. D. Pearman(3).

LIEUTENANTS.

J. R. Donaldson(3),
A. P. Norris(10),
C. H. Wells(4),
R. S. Cannon(6),
H. G. Epps(1),
L. W. Ayer(8).

FIRST SERGEANTS.

T. A. Brookbanks(1),
T. O. Lawton(4),
W. C. Forsythe(2),

SERGEANTS.

H. R. Chreitzberg(2),
J. W. Blease(10),
E. M. Matthews(13),
J. E. Cheatham(20),
H. L. Ramsey(4),
W. G. Hill(8),
C. B. Douglas(11),
H. L. Cannon(15),
J. F. Harling(5),
J. H. Spencer(7),
R. N. Reeves(21),

CORPORALS.

J. F. Moore(1),
H. G. Stokes(10),
T. R. Philipps(13),
A. B. Carr(24),
C. N. Gignilliat(25),
E. B. Boykin(4),
W. E. Chapman(9),
D. H. Salley(15),
W. F. Sneed(18),
J. D. Hunter(22),
N. D. Walker(5),
F. E. Pearman(8),
M. N. Hunter(14),
T. B. Spencer(23),
F. M. Jordan(27).
SOUTH CAROLINA EXPERIMENT STATION.

Board of Fertilizer Control.

J. P. Smith, Secretary.

Officers of Experiment Station.

Henry S. Hartzog, President of College.......................... Director
J. S. Newman............................................ Vice-Director and Agriculturist
M. B. Hardin............................................. Chief Chemist
F. S. Shiver, Ph. G........................................ Assistant Chemist
C. C. Newman............................................. Horticulturist
R. N. Brackett, Ph. D..................................... Assistant Chemist
G. E. Nesom, B. Sc., D. V. M................................ Veterinarian
*C. C. McDonnell, B. S...................................... Assistant Chemist
P. H. Rolfs, M. Sc......................................... Botanist
* B. F. Robertson, B. S.................................... Assistant Chemist
C. M. Conner, B. S........................................ Assistant Agriculturist
A. P. Anderson, Ph. D..................................... Entomologist
J. S. Pickett................................................. Experiment Station Foreman

*Engaged in fertilizer analysis.

Extracts from the "Hatch Act."

Extracts from the act of Congress, known as the "Hatch Act," approved March 2, 1887, for the establishment of Agricultural Experiment Stations in connection with Colleges established in the several States under the provisions of the Congressional Act, approved July 2, 1862, and known as the first “Morrill bill.”

Section I. * * * That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on the subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science, there shall be established under direction of the college or colleges or agricultural department of colleges in each State or Territory established, or which may hereafter be established, in accordance with the provisions of an act approved July 2, 1862, entitled “An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and mechanic arts,” or any of the supplements to said act, a department to be known and designated as an “Agricultural Experiment Station.” * * *

Sec. 2. That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at
their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and waters; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States or Territories.

Sec. 3. * * * It shall be the duty of each of said stations, annually, on or before the first day of February, to make to the Governor of the State or Territory in which it is located a full and detailed report of its operations, including a statement of receipts and expenditures. * * *

Sec. 4. That bulletins or reports of progress shall be published at said stations at least once in three months, one copy of which shall be sent to each newspaper in the States or Territories in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the station will permit. Such bulletins or reports and the annual reports of said stations shall be transmitted in the mails of the United States free of charge for postage, under such regulations as the Postmaster General may from time to time prescribe.

Sec. 5. That for the purpose of paying the necessary expenses of conducting investigations and experiments and printing and distributing the results as hereinbefore described, the sum of $15,000 per annum is hereby appropriated to each State, to be specially provided for by Congress in the appropriations from year to year, and to each Territory entitled under the provisions of Section 8 of this act, out of any money in the treasury proceeding from the sales of public lands, to be paid in equal quarterly payments, on the first day of January, April, July and October in each year, to the Treasurer or other officer duly appointed by the governing boards of said colleges to receive the same, the first payment to be made on the first day of October, 1887; provided, however, that out of the first annual appropriation so received by any station an amount not exceeding one-fifth may be expended in the erection, enlargement or repair of a building or buildings necessary for carrying on the work of such station, and thereafter an amount not exceeding five per centum of such annual appropriation may be so expended.

Sec. 7. That nothing in this act shall be construed to impair or modify the legal relation existing between any of said colleges and the government of the States or Territories in which they are respectively located.

Sec. 8. * * * And in case any State shall have established under the provisions of said act of July 2 aforesaid an agricultural department or experiment station in connection with any university, college or institution not distinctively an agricultural college or school, and such State shall have established or shall hereafter establish a separate agricultural college or school, which shall have connected therewith an experimental farm or station, the Legislature of such State may apply, in whole or in part, the appropriation by this act made to such separate agricultural college or school and no Legislature shall by contract, express or implied, disable itself from so doing.

Sec. 9. That the grants of money authorized by this act are made subject to the legislative assent of the several States and Territories to the purpose of said grant; provided, that payments of such installments of the appropriation herein made as shall become due to any State before the adjournment of the regular session of its Legislature meeting next after the passage
of this act shall be made upon the assent of the Governor thereof, duly cer-
tified to the Secretary of the Treasury.

Sec. 10. Nothing in this act shall be held or construed as binding the
United States to continue any payments from the treasury to any or all the
States or institutions mentioned in this act, but Congress may at any time
amend, suspend or repeal any or all the provisions of this act.

Experiments, Etc., for 1899.

For a full account of experiments conducted, analyses made,
bulletins issued, and other work of the Experiment Station for the
past year, see Annual Report for 1898.

Chemical Analyses 1898 and 1899.

Summary of the work of this year compared with that of last
year:

<table>
<thead>
<tr>
<th>Classification</th>
<th>1898</th>
<th>1899</th>
</tr>
</thead>
<tbody>
<tr>
<td>Official fertilizer samples</td>
<td>314</td>
<td>336</td>
</tr>
<tr>
<td>Farmers’ fertilizer samples</td>
<td>46</td>
<td>56</td>
</tr>
<tr>
<td>Waters</td>
<td>70</td>
<td>92</td>
</tr>
<tr>
<td>Phosphate rocks</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ores and minerals</td>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>Marls</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Clays and sand</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>458</td>
<td>526</td>
</tr>
</tbody>
</table>

Official Samples of Fertilizers.

The number of samples analyzed this year is 314. The analyses
are given in full in Bulletin 35.

The general results compared with those of last year are as fol-
lows:

<table>
<thead>
<tr>
<th>Classification</th>
<th>1898</th>
<th>1899</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete fertilizers</td>
<td>141</td>
<td>134</td>
</tr>
<tr>
<td>Acid Phosphates</td>
<td>63</td>
<td>73</td>
</tr>
<tr>
<td>Acid Phosphates with potash</td>
<td>50</td>
<td>68</td>
</tr>
<tr>
<td>Kainits</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>Cotton seed meals</td>
<td>39</td>
<td>40</td>
</tr>
<tr>
<td>Nitrate of soda</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sulphate of potash</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Muriate of potash</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Sylvinitie</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Nitrate of soda with potash salts</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>314</td>
<td>336</td>
</tr>
</tbody>
</table>
PUBLICATIONS OF THE SOUTH CAROLINA EXPERIMENT STATION.

(Numbers marked thus * are exhausted.)

Bulletins of the Station are sent free to all citizens of the State requesting them.

Old Series.

1886| 1888 Report of Experiment Farm.
1888| No. 1. Tests of varieties of cotton.
1888| No. 2. Tests of commercial seeds.
1888| No. 3. Analyses of fertilizers and feeding-stuffs.
1888| *Annual report.
1889| No. 4. *Entomology.
1889| No. 5. *Oats and wheat.
1889| No. 6. Hog cholera.
1889| No. 7. Meteorology.
1890| No. 8. Chemical statistics of corn crop in South Carolina.
1890| Maize fodder ensilage; cow peas as a forage crop.
1890| Composition of soja bean vines.
1890| Annual report.

New Series.

1891| No. 2. *Cotton experiments with varieties and fertilizers.
1891| No. 3. *Analyses commercial fertilizers, Part 2.
1891| No. 4. Fertilizer tests with wheat.
1891| Annual report.
1891| No. 5. Methods of keeping sweet potatoes.
1892| No. 6. Analyses of commercial fertilizers.
1892| No. 7. Experiments with wheat and oats.
1892| Annual report.
1892| No. 8. Investigation chemical composition cottonseed meal.
1893| No. 9. Experiments with Irish potatoes.
1893| No. 10. Notes on varieties of beans.
1893| No. 11. Analyses commercial fertilizers, Part 1.
1893| Annual report.
1894| No. 15. Fertilizer experiments with corn.
1894| No. 16. Experiments with tomatoes.
1894| No. 17. Analyses commercial fertilizers.
1894| No. 18. Fertilizer experiments with cotton.
1894| Annual report.
1895| No. 19. Dairying.
1895| No. 20. Analyses commercial fertilizers.
1895| No. 21. Technical.
1895| No. 22. Colic in horses and mules.
1895| Annual report.
No. 23. Lameness in horses.
No. 24. Analyses commercial fertilizers, in two parts.
No. 25. *Distemper in horses and mules.
   Annual report.
No. 28. The sweet potato as a starch-producer.
No. 29. Analyses commercial fertilizers.
No. 30. Determination of starch in the sweet potato.
No. 31. Hog cholera and swine plague.
No. 32. Protection and improvement of worn soils.
   Annual report.
No. 33. Tests of Dairy methods and apparatus.
   Comparative tests of butter-fat.
No. 34. Sugar beets.
No. 35. Analyses commercial fertilizers.
No. 36. Diseases of plants.
No. 37. Wheat.
No. 38. Asparagus rust in South Carolina.
No. 39. Suggestions to auxiliary clubs.
No. 40. Farm manures for cotton.
No. 41. Rice blast and a new rice smut.
No. 42. Varieties of cotton.
No. 43. Analyses of commercial fertilizers.
No. 44. Corn.
No. 45. Analyses of commercial fertilizers.
No. 46. Cotton.
No. 47. A chemical study of the Sea Island cotton plant.
No. 48. Broad and narrow tires.
No. 49. Strawberries.
No. 50. Tuberculosis of cattle.
No. 51. Silo construction and silage.
No. 52. Pig feeding.
No. 53. Analyses of commercial fertilizers.
FREE ANALYSES, INFORMATION, ETC.

The various departments of the College and Experiment Station will furnish, free of charge, advice and information on any topic pertaining to general agriculture, horticulture, botany, entomology, veterinary science, dairying, stock breeding, feeding, etc.; also analyses of fertilizers, marls, waters and other substances, assays of ores, determination of rocks and minerals, tests of bricks, cements, building stones, illuminating oils, calibration of electrical instruments, etc.

The departments cannot undertake to analyze stomachs or other parts of poisoned animals, make tests for poisons, nor to make bacteriological examinations.

All inquiries and requests should be addressed to the President, giving explicit account of conditions, difficulties, etc., as far as possible, and the matter will be referred promptly to the proper department for further correspondence. Before sending samples of any kind for examination or analysis, it is best to write for instructions, and thus avoid trouble and delay.