Junior Year  
First Semester  
3 - CH 3130 Quantitative Analysis  
1 - CH 3170 Quantitative Analysis Lab.  
3 - CH 3310 Physical Chemistry  
3 - Arts and Humanities Requirement1 or  
   - Social Science Requirement1  
3 - Minor Requirement  
3 - Modern Language Requirement2  
15  
Second Semester  
3 - CH 3320 Physical Chemistry  
3 - ENGL 3140 Technical Writing  
3 - Arts and Humanities (Literature) Requirement1  
3 - Minor Requirement  
3 - Modern Language Requirement2  
15  
Senior Year  
First Semester  
3 - Arts and Humanities Requirement1 or  
   - Social Science Requirement1  
3 - Chemistry Requirement2  
3 - Minor Requirement  
6 - Elective  
15  
Second Semester  
3 - CH 4500 Chemistry Capstone  
3 - Arts and Humanities Requirement1 or  
   - Social Science Requirement1  
3 - Chemistry Requirement2  
6 - Minor Requirement  
15  
123 Total Semester Hours  
1See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.  
2Students must complete through 2020 in a modern language.  
3Select from BCHM 3010, 3050, 4060, 4230, CH 3390, 3400, 3600, 3990, 4000, 4010, 4020, 4030, 4040, 4110, 4120, 4130, 4410, 4510, 4520, 4520, 4530, 4560, 4630, 4640, 4650, 4710, 4990, CHE 3070, EES 4110, 4850, ETOX 4210, 4500, FDSC 4010, 4020, 4030, GEOL 3180, MSE 4020, 4150, PHYS 4520, 4810  
CHEMISTRY  
Bachelor of Science  
Chemistry, an experimental discipline based on observation guided by molecular theory, is of fundamental importance in much of modern science and technology. Its molecular concepts form the basis for ideas about complex material behavior. Due to the fundamental nature and extensive application of chemistry, an unusually large variety of challenging opportunities to contribute in the science-oriented community are open to students whose education is built around the principles of this discipline.  
The Chemistry curriculum, through the career requirement options and the large number of electives, provides students the opportunity to select a coherent program of study beyond the basic courses. Career requirement options are provided for students anticipating graduate study in chemistry or related fields; employment following the BS degree in laboratory, production, technical sales, or management positions; professional studies (e.g., medicine); chemical physics; geochemistry; and employment in fields requiring extensive preparation in courses other than sciences (e.g., patent law and technical writing). Significant features of the curriculum are the student’s extensive participation in experimental work and the opportunity to take part in a research investigation during the junior and senior years.  
Freshman Year  
First Semester  
4 - CH 1010 General Chemistry  
4 - MATH 1060 Calculus of One Variable I  
3 - Arts and Humanities Requirement1 or  
   - Social Science Requirement1  
4 - Technical Requirement2  
15  
Second Semester  
4 - CH 1020 General Chemistry  
3 - ENGL 1030 Composition and Rhetoric  
4 - MATH 1080 Calculus of One Variable II  
3 - PHYS 1220 Physics with Calculus I  
1 - PHYS 1240 Physics Laboratory I  
15  
Sophomore Year  
First Semester  
3 - CH 2230 Organic Chemistry  
1 - CH 2270 Organic Chemistry Lab.  
4 - MATH 2060 Calculus of Several Variables  
3 - PHYS 2210 Physics with Calculus II  
1 - PHYS 2230 Physics Lab. II  
3 - Arts and Humanities Requirement1 or  
   - Social Science Requirement1  
15  
Second Semester  
3 - CH 1520 Chemistry Communication  
3 - CH 2050 Introduction to Inorganic Chemistry  
3 - CH 2240 Organic Chemistry  
1 - CH 2280 Organic Chemistry Lab.  
3 - Advanced MATH Requirement1  
3 - Arts and Humanities (Literature) Req.1  
16  
Junior Year  
First Semester  
3 - CH 3130 Quantitative Analysis  
2 - CH 3150 Quantitative Analysis Lab.  
3 - CH 3310 Physical Chemistry  
1 - CH 3390 Physical Chemistry Lab.  
1 - CH 3410 Introduction to Research  
3 - Inorganic Chemistry Requirement4  
3 - Elective  
16  
Second Semester  
3 - CH 3320 Physical Chemistry  
3 - CH 3400 Physical Chemistry Lab.  
3 - CH 3600 Chemical Biology1  
3 - CH 4110 Instrumental Analysis  
2 - CH 4120 Instrumental Analysis Lab.  
3 - Elective  
15  
Senior Year  
First Semester  
3 - CH 4430 Research Problems  
3 - Arts and Humanities Requirement1 or  
   - Social Science Requirement1  
3 - Chemistry Requirement6  
6 - Elective  
15  
Second Semester  
2 - CH 4030 Advanced Synthetic Techniques  
3 - CH 4440 Research Problems  
3 - CH 4500 Chemistry Capstone  
3 - Chemistry Requirement6  
3 - Elective  
14  
121 Total Semester Hours  
1See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.  
2Select BIOL 1100, CPSC 1010, GEOL 1010/1030, or ENGR 1050/1060/1070/1080  
3MATH 2080, 3020 or 3110  
4CH 4010 or 4020  
5BCHM 3050 may be substituted for CH 3600.  
6Select from BCHM 3010, 3050, 4060, 4230, CH 3990, 4000, 4010, 4040, 4140, 4210, 4250, 4270, 4350, 4360, 4430, 4460, 4710, 4990, CHE 3070, EES 4110, 4850, ETOX 4210, 4500, FDSC 4010, 4020, 4030, GEOL 3180, MSE 4020, 4150, PHYS 4520, 4810  
GENETICS  
Bachelor of Science  
Genetics is the study of heredity. Genetics research takes many forms, from the study of heredity at the level of individual molecules to study at the level of cells and chromosomes, individuals, or populations. To comprehend current genetic information and to make future contributions to our molecular understanding of life processes, students must obtain a broad background in biology and a firm foundation in chemistry and mathematics. This is the basis of the genetics curriculum.  
A degree in Genetics is a strong preparation for many careers. The degree provides an excellent foundation for medical, veterinary, or pharmacy school, as well as graduate research in any discipline related to biology, including bioinformatics, forensic technology, and genetic counseling. Because of the increasing emphasis on genetics in everyday life, a Bachelor of Science in Genetics can also be a direct path to a career in the emerging biotechnology industries (pharmaceuticals, agricultural technologies, biomimetic minerals) in research, sales, or business operations. Combined with a law degree, a genetics bachelor of science is a good background for a career as a patent attorney.  
Freshman Year  
First Semester  
5 - BIOL 1100 Principles of Biology I  
4 - CH 1010 General Chemistry  
1 - GEN 1030 Careers in Biochem. and Genetics  
4 - MATH 1060 Calculus of One Variable I  
14
Second Semester
5 - BIOL 1110 Principles of Biology II
4 - CH 1020 General Chemistry
3 - ENGL 1030 Composition and Rhetoric
4 - MATH 1080 Calculus of One Variable II

Sophomore Year
First Semester
3 - CH 2230 Organic Chemistry
1 - CH 2270 Organic Chemistry Lab.
1 - COMM 1500 Intro. to Human Comm. or
3 - COMM 2500 Public Speaking
3 - GEN 3020 Molecular and General Genetics
3 - PHYS 1220 Physics with Calculus I
1 - PHYS 1240 Physics Lab.

Second Semester
3 - BCHM 3010 Molecular Biochemistry
1 - CH 2240 Organic Chemistry
1 - CH 2280 Organic Chemistry Lab.
2 - GEN 3040 Molecular Biology Lab.
3 - STAT 2300 Statistical Methods I
3 - Arts and Humanities (Literature) Requirement
3 - Social Science Requirement

Junior Year
First Semester
3 - GEN 4200 Molecular Genetics and Gene Reg.
2 - GEN 4210 Molecular Genetics and Gene Regulation Lab.
3 - GEN (BCHM) 4400 Bioinformatics
3 - Science Requirement
3 - Social Science Requirement

Second Semester
3 - BIOL 4610 Cell Biology
3 - GEN 4100 Population and Quantitative Gen.
2 - GEN 4110 Population and Quantitative Gen. Lab.
3 - PHIL 3260 Science and Values
3 - Genetics Requirement
3 - Elective

Senior Year
First Semester
3 - GEN 4500 Comparative Genetics
3 - Genetics Requirement
3 - Science Requirement
6 - Elective

Second Semester
2 - GEN 4930 Senior Seminar
3 - Genetics Requirement
3 - Science Requirement
6 - Elective
122 Total Semester Hours

Medical, veterinary, and graduate school requirements often include two semesters of physics with calculus and the physics laboratory. Students are encouraged to check requirements for admission to professional graduate programs.

Notes:
1. A student is allowed to enroll in science and mathematics courses only when all prerequisites have been passed with a grade of C or better.
2. A minimum grade of C is required in all science and mathematics courses. No student may exceed a maximum of two attempts, excluding a W, to complete successfully any science or mathematics course.

Mathematical Sciences
The Mathematical Sciences curriculum is designed to be versatile. Students gain a broad knowledge of mathematical concepts and methods that are applicable in sciences, engineering, business, industry, and other professions requiring a strong mathematical background. In addition to the basic courses that provide necessary mathematical skills, the curriculum allows students to select an emphasis area or concentration, providing an introduction to a specific area where mathematics is used. These are Abstract Mathematics, Actuarial Science/Financial Mathematics, Applied and Computational Mathematics, Biology, Computer Science, Operations Research/Management Science, and Statistics.

In addition to the overall goal of preparing students to cope with a variety of mathematical problems, the curriculum seeks to provide an adequate background for students who plan to pursue graduate study or positions in business, industry, or government. Students electing the Biology Concentration will have the necessary preparation for entering medical school. More information about the degree program can be found at www.clemson.edu/ces/departments/math.

All mathematical sciences majors are required to complete a capstone experience that provides an opportunity to pursue research, independent study, or an approved internship under the direction of a faculty member, or the opportunity to study mathematical models in some area of the mathematical sciences. The capstone experience requires a written report (thesis, computer code, project description, internship experience, etc.) and an oral or poster presentation by each student.

Combined Bachelor's/Master's Plan
Under this plan, students may reduce the time necessary to earn both degrees by applying up to 12 graduate credits to both undergraduate and graduate program requirements. Students are encouraged to obtain the specific requirements for pursuing the combined degree from the Department of Mathematical Sciences www.clemson.edu/ces/departments/math. as early as possible in their undergraduate program. Enrollment guidelines and procedures can be found under Academic Regulations in this catalog.

Bachelor of Arts
Freshman Year
First Semester
4 - MATH 1060 Calculus of One Variable I
3 - Modern Language Requirement
6 - Social Science Requirement
1 - Elective
14
Second Semester
3 - ENGL 1030 Composition and Rhetoric
4 - MATH 1080 Calculus of One Variable II
3 - Computer Science Requirement
3 - Modern Language Requirement
3 - Science and Technology in Society Req.
16

Sophomore Year
First Semester
4 - MATH 2060 Calculus of Several Variables
1 - MATH 2500 Intro. to Mathematical Sciences
3 - MATH 3600 Intermed. Math. Computing or
3 - EDSC 4370 Technology in Sec. Math.
3 - Arts and Humanities (Literature) Requirement
3 - Cross-Cultural Awareness Requirement
14
Second Semester
4 - MATH 2080 Intro. to Ordinary Diff. Equations
3 - MATH 3020 Statistics for Science and Engr.
3 - MATH 3110 Linear Algebra
3 - Arts and Humanities (Non-Lit.) Requirement or
3 - Minor Requirement or
3 - Second Major Requirement
16
Junior Year
First Semester
3 - MATH 3190 Introduction to Proof
3 - Advanced Writing Requirement
3 - Math Science Requirement
4 - Natural Science Requirement
3 - Elective
16
Second Semester
3 - COMM 2500 Public Speaking
3 - MATH 4120 Introduction to Modern Algebra
3 - Minor Requirement or
3 - Second Major Requirement
4 - Natural Science Requirement
3 - Elective
16
Senior Year
First Semester
3 - MATH 4330 Advanced Calculus I
3 - Capstone Experience
3 - Minor Requirement or
3 - Second Major Requirement
3 - Math Science Requirement
3 - Elective
15