## DEPARTMENT OF NATURAL SCIENCES

[Science Education](#_Toc303536273)

[Bachelor Of Science Degree In Biology](#_Toc303536274)

[Program Of Study](#_Toc303536275)

[Bachelor Of Science Degree In Science Education](#_Toc303536276)

[Program Of Study](#_Toc303536277)

[Bachelor Of Science Degree In Chemistry](#_Toc303536279)

[Program Of Study](#_Toc303536280)

[Required Courses For A Minor In Chemistry](#_Toc303536282)

[Required Courses For Pre-Engineering And Dual Degree Programs](#_Toc303536283)

[Dual Degree Requirements](#_Toc303536284)

The Department of Natural Sciences offers degrees in biology and chemistry with course offerings in physics and engineering. The department also offers a degree in science education with a broad based emphasis in the biology area.

**BIOLOGY**

The major in biology provides courses and course sequences leading to the Bachelor of Science degree in biology. The program prepares a student for professional careers and employment in biological sciences and teaching in the area of biology. Flexibility and design of the program aids in preparation for entrance into graduate, medical, pharmacy and dental schools, as well as other professional schools. Students interested in attending medical and dental schools choose from a select number of biology and chemistry courses and are advised by the Pre-Health Advisor.

Students majoring in biology must complete a minimum of 32 hours in biology, including Biology 2111K, 2112K, 2211K, 2311K, 3101K, 3501K, 4001, 4222 and 4701K. Additionally, the Biology major must complete 13 hours of biology electives with a minimum of 8 hours at the 3000 and 4000 level. The electives will be chosen by the student with the advisor from a list of approved electives. Biology majors and minors must make a “C” or better in all biology, chemistry, physics, and mathematics courses. Students must meet the requirements of the Core Curriculum. Students must also take the Area Concentration Achievement Test (ACAT) in biology during the senior year.

**CHEMISTRY**

The major in chemistry provides courses and sequences leading to the Bachelor of Science degree in chemistry. The program is designed to follow the criteria for baccalaureate degrees set forth by the Committee on Professional Training of the American Chemical Society. The program prepares students for professional employment after graduation and also provides strong academic and laboratory experiences for those who wish to pursue graduate degrees in chemistry or attend professional schools.

Students must meet the requirements listed in the Core Curriculum. Students must also complete a minimum of 49 semester hours of chemistry. All students are required to earn at least a grade of “C” in all chemistry, biology, physics, and mathematics courses. All students are required to take the American Chemical Society standardized test in the area in which they are enrolled. Students must also take the chemistry exit exam, the Major Field Test (MFT) during the senior year.

## SCIENCE EDUCATION

The Bachelor of Science in Science Education is approved by Georgia Professional Standards Commission (PSC) and National Council of Accreditation for Teacher Education. The program leads to Level-4 teacher certification and is Broad field Science with biology emphasis.

Upon admission to Albany State University, students who have declared science education as their major must formally apply to the Teacher Education Program. Students must meet the following requirements to be fully admitted to the Teacher Education Program. These requirements include: 1) completion of a minimum 36 semester hours in core and prescribed courses with a cumulative grade point average (GPA) of 2.5 or better; 2) successful completion of Basic Test for Georgia Assessment for Certification of Educators (GACE1); and 3) acceptable history of mental, emotional and physical health. The exit exam for the program is GACE II, which is content area must be taken by all students.

**ENGINEERING**

Albany State University offers two tracks of pre-engineering programs that lead to a Bachelor of Engineering degree from the Georgia Institute of Technology: (1) The Regents’ Engineering Transfer Program (RETP) and (2) Dual Degree Program.

**TRACK 1**

The Regents Engineering Transfer Program (RETP) is a cooperative program between the Georgia Institute of Technology and Albany State University that allows students to complete the first two years of the engineering program at Albany State University and then transfer to Georgia Tech to their chosen field of engineering to complete the requirements of B.S. degree in engineering. Student will be admitted to Georgia Tech upon completion of the prescribed courses at Albany State University provided (s)he maintains an overall GPA of 2.7 as well as 2.7 in science and mathematics courses at ASU. At times Georgia Tech may add certain requirements for admission to junior level, which will equally be applied to Georgia Tech students also for advancing to the junior level in that field.

To be eligible for admission to the RETP at Albany State University student must be a resident of Georgia and must have a combined minimum SAT score of 1090 including minimum of 560 on the math and 440 on the verbal portion and a high school GPA of “B” or better. Students who prefer to live and study in a smaller community may also transfer to Georgia Tech Regional Engineering Program (GTREP) at coastal city of Savannah and receive the Georgia Tech engineering degree by completing their studies at Georgia Tech campus at Savannah.

**TRACK 2**

The Dual Degree Program is also a cooperative program between Georgia Tech and Albany State University that is designed for students who want to have a broad liberal arts background in addition to their chosen field of engineering. The student will complete approximately three years of study towards a program in Chemistry, Computer Science or Mathematics at Albany State University and then transfer to Georgia Tech for two additional years of study in his/her chosen field of engineering. Upon successful completion of the two programs, student will earn a B.A. degree from Albany State University and a B.S. degree in Engineering from Georgia Tech. The admission and transfer GPA requirements for Dual Degree Program are the same as the RETP program though additional courses as described later in this catalog are needed to qualify for transfer under the Dual Degree Program.

Students are advised to follow the customized list of courses as detailed in this catalog for each engineering discipline in order to complete their degree goal in the most efficient manner. Non-residents of Georgia and international students can also join the engineering program at ASU though the transfer to Georgia Tech will require higher GPA. After completing the program one may also apply for transfer to any other ABET accredited engineering college any. In the past, students have transferred to the engineering programs at Auburn, Florida A & M, Tuskegee, North Carolina A&T Mercer, Southern Polytechnic and University of Texas at Arlington.

## BACHELOR OF SCIENCE DEGREE IN BIOLOGY

|  |  |  |  |
| --- | --- | --- | --- |
| **Area** |  |  | **Credit hours** |
| **Core Curriculum** |  |  | **(60 hours)** |
| AREA A1 | Communication Skills |  | 6 |
| AREA A2 | Quantitative Skills |  | 3 |
| AREA B | Institutional Options |  | 5 |
| AREA C | Humanities, Fine Arts and Ethics |  | 6 |
| AREA D | Natural Science, Math & Tech |  | 11 |
| AREA E | Social Sciences |  | 12 |
| AREA F | Courses Related to Major | Prerequisite | (16+1)\* |
| Biology I. Required: 18 hours, lower division (1000-2000 Level) | |  |  |
| BIOL 2111K | Biology I (4 hours) |  |  |
| BIOL 2112K | Biology II (4 hours) |  |  |
| CHEM 2301K | Organic Chemistry I (4 hours) |  |  |
| CHEM 2302K | Organic Chemistry II (4 hours) |  |  |
|  |  |  |  |
| **Above The Core** |  |  | **(5 hours)** |
|  |  |  |  |
| **AREA G: Major Courses** | |  | **(62-1 hours)\*** |
| BIOL 2211K | General Microbiology |  | 4 |
| BIOL 2311K | General Botany |  | 4 |
| BIOL 3101K | Environmental Biology |  | 4 |
| BIOL 3501K | Principles of Genetics |  | 4 |
| BIOL 4001 | Research and Independent Study I |  | 1 |
| BIOL 4222 | Biology Research |  | 3 |
| BIOL 4701K | Cell and Molecular Biology |  | 4 |
| CHEM 3250K | Biochemistry |  | 4 |
| MATH 1211 | Calculus I |  | 4 |
| PHYS 1111K | Introductory Physics I |  | 4 |
| PHYS 1111K | Introductory Physics II |  | 4 |
| PHYS 2100 | Computer Applications (If not in Area D) |  |  |
| SPAN, FREN OR GRMN Foreign Language sequence | |  | 6 |
| Electives (Non-Science) | |  | 3 |
| Electives (Biology) |  |  | 13 |
| *\*1 credit from Area G will be counted in Area F due to the fact that most science courses are 4 credit hours.* | | | |
|  |  |  |  |
| **Total required for graduation** | |  | **(126 hours)** |

## PROGRAM OF STUDY FOR A BACHELOR OF SCIENCE DEGREE IN BIOLOGY

*(Suggested Program of Study Only! Student should consult with faculty advisor)*

126 semester hours

|  |  |  |  |
| --- | --- | --- | --- |
| **Freshman Year** |  | **Fall** | **Spring** |
| ASU 1201 | Foundations of College Success | 2 |  |
| HIST 1002 | Intro. to African Diaspora | 2 |  |
| ENGL 1101 and 1102 | English Composition I & II | 3 | 3 |
| MATH 1113 | Pre-Calculus |  | 3 |
| CHEM 1211K and 1212K | General Chemistry I & II | 4 | 4 |
| BIOL 2111K and 2112K | Biology I & II | 4 | 4 |
| BIOL 1801 | (Suggested Elective) |  | 1 |
| PEDH | Choice |  | **1** |
| **Total** |  | **(15 hrs)** | **(16 hrs)** |
|  |  |  |  |
| **Sophomore Year** |  | **Fall** | **Spring** |
| PEDH | Choice | 1 | 1 |
| ENGL 2111 | World Literature |  | 3 |
| CHEM 2301K and 2302K | Organic Chemistry I and II | 4 | 4 |
| BIOL 2211K | General Microbiology |  | 4 |
| POLS 1101 | U.S. & GA Government |  | 3 |
| MATH 1211 | Calculus I | 4 |  |
| PHYS 2100 | Computer Applications | 3 |  |
| BIOL 2311K | Botany I | 4 |  |
| **Total** |  | **(16 hrs)** | **(15 hrs)** |
|  |  |  |  |
| **Junior Year** |  | **Fall** | **Spring** |
| HIST 1111 | World History I |  | 3 |
| MUSC 1100 | Music Apprec. or ARAP 1100 Art Apprec. |  | 3 |
| PHYS 1111K and 1112K | Introduction to Physics I and II | 4 | 4 |
| BIOL 3101K | Environmental Biology |  | 4 |
| CHEM 3250K | Biochemistry | 4 |  |
| COMM 1100 | Fundamentals of Public Speaking | 3 |  |
| BIOL 3501K | Principles of Genetics | 4 |  |
| BIOL | Elective |  | **4** |
| **Total** |  | **(15 hrs)** | **(18 hrs)** |
|  |  |  |  |
| **Senior Year** |  | **Fall** | **Spring** |
| BIOL 4222 | Biology Research |  | 3 |
| BIOL 4701K | Cell and Molecular Biology | 4 |  |
| Foreign Language (Spanish, French of German sequence) | | 3 | 3 |
| NON-Science Electives | |  | 3 |
| Biology Electives |  | 4 | 4 |
| BIOL 4001 | Research and Indep. Study I | 1 |  |
| Area E | Choice | 3 | 3 |
| **Total** |  | **(15 hrs)** | **(16 hrs)** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Biology Electives** |  |  |  | **Credit Hrs.** |
| **Courses** | Title |  |  |  |
| BIOL | 1801 | Science Career Explorations | | 1 |
| BIOL | 2113K | Invertebrate Zoology | | 3 |
| BIOL | 2312K | General Botany II | | 4 |
| BIOL | 2412K | Anatomy and Physiology II | | 4 |
| BIOL | 2320K | Lab Research Techniques | | 3 |
| BIOL | 2415 | Scientific Writing | | 3 |
| BIOL | 2702K | Fundamentals of Biotechnology | | 4 |
| BIOL | 3201K | Entomology | | 4 |
| BIOL | 3309K | Plant Anatomy | | 3 |
| BIOL | 3311K | Introduction to Natural Resources | | 3 |
| BIOL | 3312K | Planning and Managing Natural Resources | | 3 |
| BIOL | 3313K | Natural Resources and Environmental Policy | | 3 |
| BIOL | 3314K | Conservation of Energy | | 3 |
| BIOL | 3315K | Conservation of Energy Resources | | 3 |
| BIOL | 3316K | Sources and Uses of Plant & Wildlife Resources | | 3 |
| BIOL | 3317K | Natural Resources and Food Production | | 3 |
| BIOL | 3318K | Marine Life Resources | | 3 |
| BIOL | 3319K | Conservation of Marine Life Resources | | 3 |
| BIOL | 3320K | Principles and Techniques in Water Resource Services | | 4 |
| BIOL | 3321K | Conservation of Plant and Wildlife Resources | | 3 |
| BIOL | 3401K | Introduction to Histology | | 4 |
| BIOL | 3506 | Bioinformatics | | 3 |
| BIOL | 3611K | Medical Mycology | | 4 |
| BIOL | 3701 | Current Issues and Topics in Biotechnology | | 2 |
| BIOL | 3801K | Electron Microscopy | | 3 |
| BIOL | 3901 | Pathophysiology | | 3 |
| BIOL | 4002 | Research and Independent Study II | | 1 |
| BIOL | 4101K | General Physiology | | 4 |
| BIOL | 4201K | Introduction to Parasitology | | 4 |
| BIOL | 4301K | Developmental Biology | | 4 |
| BIOL | 4401K | Comparative Vertebrate Anatomy | | 4 |
| BIOL | 4501K | Immunology | | 4 |
| BIOL | 4601K | Plant Physiology | | 4 |
| BIOL | 4702K | Biotechnology | | 4 |
| BIOL | 4703K | Genetic Engineering | | 4 |

**RECOMMENDED ELECTIVES FOR SPECIFIC CAREER CHOICES I. Graduate School Courses selected in conjunction with advisor.**

|  |  |  |  |
| --- | --- | --- | --- |
| **II. Pre-Health Careers (Courses are selected from those listed below).** | | |  |
| BIOL | 3401K | Histology |  |
| BIOL | 4101K | General Physiology | |
| BIOL | 4301K | Developmental Biology | |
| BIOL | 4401K | Comp. Vert. Anatomy | |
| **III. Biological Careers (Botanical Emphasis)** | | |  |
| BIOL | 3309K | Plant Anatomy | |
| BIOL | 2312K | Botany |  |
| BIOL | 4601K | Plant Physiology | |
|  |  |  |  |
| **IV. Biotechnology Concentration** | | |  |
| BIOL | 2702K | Fundamentals of Biotechnology | 4 |
| BIOL | 3506 | Bioinformatics | 3 |
| BIOL | 3701 | Current Issues and Topics in Biotechnology | 2 |
| BIOL | 4703K | Genetic Engineering | 4 |
|  |  |  |  |
| **MINOR IN BIOLOGY (Minimum of 20 hours)** | | |  |
| Students desiring a minor in Biology are required to complete the following courses: | | | |
| BIOL |  | 2111K and 2112K General Biology I and II | 8 |
| BIOL | 2311K | General Botany I | 4 |
| BIOL | 3101K | Environmental Biology or appropriate Biology substitute | 4 |
| BIOL | 4701K | Cell and Molecular Biology | 4 |
| **Total** |  |  | **(20 hrs)** |
|  |  |  |  |
| **MINOR IN Biology (Environmental Emphasis)** | | |  |
| (Minor acquired after completion of a minimum of 21 hours) | | |  |
|  |  |  |  |
|  |  |  |  |
| **Required Courses for a Minor in Natural Resources** | | | **(9 hours)** |
| BIOL | 3311K | Introduction to Natural Resources | 3 |
| BIOL | 3312K | Planning and Managing Natural Resources | 3 |
| BIOL | 3313K | Natural Resources and Environmental Policy | 3 |
|  |  |  |  |
| Four Additional Courses from Categories I, II, III and IV: | | |  |
| I .BIOL | 3314K | Use of Energy Resources or | 3 |
| BIOL | 3315K | Conservation of Energy Resources | 3 |
| II. BIOL | 3318K | Marine Life Resources or | |
| BIOL | 3319K | Conservation of Marine Life Resources | 3 |
| III. BIOL | 3320K | Principles and Techniques in Water Resources Services | 4 |
| BIOL | 3316K | Sources and Uses of Plants and Wildlife Resources | 3 |
| IV. BIOL | 3317K | Natural Resources and Food Production | 3 |
| BIOL | 3321K | Conservation of Plant and Wildlife Resources | 3 |

## BACHELOR OF SCIENCE DEGREE IN SCIENCE EDUCATION

**BROAD BASED SCIENCE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Area** |  |  | **Credit hours** |
| **Core Curriculum** |  |  | **(60 hours)** |
| AREA A1 | Communication Skills |  | 6 |
| AREA A2 | Quantitative Skills |  | 3 |
| AREA B | Institutional Options |  | 5 |
| AREA C | Humanities, Fine Arts and Ethics |  | 6 |
| AREA D | Natural Science, Math & Tech |  | 10 |
| AREA E | Social Sciences |  | 12 |
| AREA F | Courses Related to Major | Prerequisite | 18 |
| lower division (1000-2000 level) | |  |  |
| PHYS 1111K | Introductory Physics I (4 hrs) |  |  |
| PHYS 1112K | Introductory Physics II (4 hrs) |  |  |
| BIOL2111K | Biology I (4 hrs) |  |  |
| EDUC 2110 | Invest Critical/Contemporary Issues in Ed. (3 hrs) | |  |
| EDUC 2120 | Explore Soci/Cul Perspectives (3 hrs) |  |  |
| \*1 credit from Area D (1 hr) | |  |  |
| \*1 credit from Area G (1 hr) | |  |  |
| \*Such an arrangment is necessary because most science courses are 4 credit hours. | | | |
|  |  |  |  |
| **Above The Core** |  |  | **(5 hours)** |
|  |  |  |  |
| **Area G - Major requirements** | |  | **(60 hours)** |
| EDUC 2110 | Invest Critical/Contemporary Issues in Ed. | | 3 |
| EDUC 2120 | Explore Soci/Cul Perspectives |  | 3 |
| EDUC 2130 | Expl Teaching/ Learning |  | 3 |
| EDUC 4412 | Student Teaching |  | 12 |
| EDUC 4405 | Methods/Material of Teaching Science |  | 3 |
| EDUC 4400 | Prep. for Teaching |  | 2 |
| EDUC 4441 | Teaching Reading in Sec. Sch. |  | 3 |
| CHEM 2301K | Organic Chemistry I |  | 4 |
| CHEM 2302K | Organic Chemistry II |  | 4 |
| CHEM 3250K | Biochemistry |  | 4 |
| PHYS 3002 | Advance Earth Space Science |  | 4 |
| BIOL 2211K | Intro to Microbiology |  | 4 |
| BIOL 3501K | Principle of Genetics |  | 4 |
| BIOL 2311K | General Botany I |  | 4 |
| SPED 3230 | Contemp. Perspective of Exceptional Students |  | 3 |
|  |  |  |  |
| **Total required for graduation** | |  | **(125 hours)** |

## PROGRAM OF STUDY FOR THE BACHELOR OF SCIENCE DEGREE IN SCIENCE

## EDUCATION BROAD BASED EMPHASIS

125 semester hours

|  |  |  |  |
| --- | --- | --- | --- |
| **Freshman Year** | | **Fall** | **Spring** |
| ASU 1201 | Foundations of College Success | | 2 |
| HEDP 1001 | Introduction to Wellness or PEDH | 1 |  |
| HIST 1002 | Intro. to the African Diaspora | 2 |  |
| ENGL 1101 | English Composition I | 3 |  |
| ENGL 1102 | English Composition II |  | 3 |
| MATH 1113 | Pre-Calculus | 3 |  |
| BIOL 2111K | Biology I | 4 |  |
| BIOL 2112K | Biology II |  | 4 |
| CHEM 1211K | General Chemistry I | 4 |  |
| CHEM 1212K | General Chemistry II |  | 4 |
| EDUC 2110 | Inves. Critical/Contemporary Issues in Edu. | | 3 |
| **Totals** |  | **(17 hrs)** | **(16 hrs)** |
|  |  |  |  |
| **Sophomore Year** | | **Fall** | **Spring** |
| ENGL 2111 | World Literature |  | 3 |
| PEDH 100X | Fitness or other choice | 1 |  |
| MATH 1211 | Calculus I | 4 |  |
| BIOL 2311K | Botany I | 4 |  |
| EDU 2120 | Explore Socio. Culture Perspective on Divers. | 3 |  |
| BIOL 2211K | General Microbiology |  | 4 |
| POLS 1101 | U.S. and GA Government |  | 3 |
| CHEM 2301K | Organic Chemistry I | 4 |  |
| CHEM 2302K | Organic Chemistry II |  | 4 |
| EDU 2130 | Explore Teaching/Learning |  | 3 |
| **Totals** |  | **(16 hrs)** | **(17 hrs)** |
|  |  |  |  |
| **Junior Year** | | **Fall** | **Spring** |
| PHYS 1111K | Introductory Physics I | 4 |  |
| PHYS 1112K | Introductory Physics II |  | 4 |
| BIOL 3501K | Principles of Genetics | 4 |  |
| CHEM 3250K | Biochemistry | 4 |  |
| COMM 1100 | Fundamentals of Public Speaking | 3 |  |
| SPED 3230 | Contemp Perspective of Except Students | 3 |  |
| Area C | elective, Fine Arts/ Humanity elective | | 3 |
| PHYS 3002 | Adv Earth/ Space Science |  | 4 |
| PEDH | Choice, 100X Physical Education Choices | | 1 |
| Area E | elective, Social Science Elective | | 3 |
| **Total** |  | **(18 hrs)** | **(15 hrs)** |
|  |  |  |  |
|  |  |  |  |
| **Senior Year** | | **Fall** | **Spring** |
| Area E | Social Science Elective | 3 |  |
| EDUC 4400 | Prep. for Teaching | 2 |  |
| EDUC 4441 | Teaching Reading | 3 |  |
| HIST 1111 | World History I (or other history elective) | 3 |  |
| EDUC 4405 | Methods of Teaching Science | 3 |  |
| EDUC 4412 | Student Teaching |  | 12 |
| **Total** |  | **(14 hrs)** | **(12 hrs)** |

## BACHELOR OF SCIENCE DEGREE IN CHEMISTRY

|  |  |  |  |
| --- | --- | --- | --- |
| **Area** |  |  | **Credit hours** |
| **Core Curriculum** | |  | **(60 hours)** |
| AREA A1 | Communication Skills |  | 6 |
| AREA A2 | Quantitative Skills |  | 3 |
| AREA B | Institutional Options |  | 5 |
| AREA C | Humanities, Fine Arts and Ethics | | 6 |
| AREA D | Natural Science, Math & Tech | | 10t |
| AREA E | Social Sciences |  | 12 |
| AREA F | Courses Related to Major | Prerequisite | 18 |
| lower division (1000-2000 Level) | |  |  |
| CHEM 1211K General Chemistry I (4 hrs) | | |  |
| CHEM 1212K General Chemistry II (4 hrs) | | |  |
| CHEM 2301K Organic Chemistry I (4 hrs) | | |  |
| CHEM 2302K Organic Chemistry II (4 hrs) | | |  |
| \*1 credit from Area D (1 hr) | |  |  |
| \*1 credit from Area G (1 hr) | |  |  |
| \*Such an arrangment is necessary because most science courses are 4 credit hours. | | | |
|  |  |  |  |
| **Above The Core** | |  | **(5 hours)** |
|  |  |  |  |
| **Area G: Major requirements** | |  | **(60 hours)** |
| BIOL 2111K | Biology I |  | 4 |
| MATH 2212 | Calculus II |  | 4 |
| MATH 2213 | Calculus III |  | 4 |
| CHEM 2351K | Quantitative Analysis I |  | 4 |
| CHEM 2352K | Quantitative Analysis II |  | 4 |
| CHEM 3221K | Physical Chemistry I |  | 4 |
| CHEM 3222K | Physical Chemistry II |  | 4 |
| CHEM 3231 | Intermediate Inorganic Chemistry I | | 3 |
| CHEM 3250K | Biochemistry |  | 4 |
| CHEM 4100K | Instrumental Analysis |  | 4 |
| CHEM 4110 | Chemical Literature |  | 1 |
| CHEM 4111 | Junior Seminar |  | 1 |
| CHEM 4120 | Senior Research I |  | 1 |
| CHEM 4130K | Senior Research II |  | 3 |
| PHYS 2100 | Computer Applications |  | 3 |
| Electives (2000 level or higher including at least one 3 hr. class outside the department) | | | 12 |
|  |  |  |  |
| **Total required for graduation** | |  | **(125 hours)** |

## PROGRAM OF STUDY FOR THE BACHELOR OF

## SCIENCE DEGREE IN CHEMISTRY

125 semester hours

|  |  |  |  |
| --- | --- | --- | --- |
| **Freshman Year** |  | **Fall** | **Spring** |
| **ASU 1201** | **Found. of College Success** | **2** |  |
| ENGL 1101 | English Composition I | 3 |  |
| ENGL 1102 | English Composition II |  | 3 |
| MATH 1113 | Pre-Calculus | 3 |  |
| MATH 1211 | Calculus I |  | 4 |
| CHEM 1211K | General Chemistry I | 4 |  |
| CHEM 1212 K | General Chemistry II |  | 4 |
| PHYS 2100 | Computer Applications |  | 3 |
| Area E | Social Sciences : History | 3 |  |
| HIST 1002 | Intro. to African Diaspora |  | 2 |
| **Totals** |  | **(15 hrs)** | **(16 hrs)** |
|  |  |  |  |
| **Sophomore Year** |  | **Fall** | **Spring** |
| ENGL 2111 | World Literature I |  | 3 |
| PEDH 1001-1010 |  |  | 1 |
| PHYS 2221K | Principles of Physics I |  | 4 |
| CHEM 2301K | Organic Chemistry I | 4 |  |
| **CHEM 2302K** | **Organic Chemistry II** |  | **4** |
| CHEM 2351K | Quantitative Analysis I | 4 |  |
| **CHEM 2352K** | **Quantitative Analysis II** |  | **4** |
| MATH 2212 | Calculus II | 4 |  |
| Area C | Humanities/Fine Arts | 3 |  |
| HEDP 1001 | Introduction to Wellness | 1 |  |
| **Total** |  | **(16 hrs)** | **(16 hrs)** |
|  |  |  |  |
| **Junior Year** |  | **Fall** | **Spring** |
| CHEM 3221K | Physical Chem. I |  | 4 |
| CHEM 4110 | Chemical Literature | 1 |  |
| Area E | Social Sciences: GS & GA Gov’t | 3 | 3 |
| Area E | Social Sciences |  | 3 |
| BIOL 2111K | Biology I |  | 4 |
| MATH 2213 | Calculus III | 4 |  |
| PHYS 2222K | Principles of Physics II | 4 |  |
| COMM 1100 | Fundamentals of Public Speaking | 3 |  |
| PEDH 1001-1010 |  | 1 |  |
| CHEM 4111 | Junior Seminar I |  | 1 |
| **Total** |  | **(16 hrs)** | **(15 hrs)** |
|  |  |  |  |
| **Senior Year** |  | **Fall** | **Spring** |
| CHEM 3222K | Physical Chemistry II | 4 |  |
| CHEM 3231 | Intermediate Inorganic I |  | 3 |
| CHEM 4100K | Instrumental Analysis |  | 4 |
| CHEM 4120 | Senior Research I | 1 |  |
| CHEM 4130K | Senior Research II |  | 3 |
| CHEM 3250K | Biochemistry | 4 |  |
| Area F | Electives | 6 | 6 |
| **Total** |  | **(15 hrs)** | **(16 hrs)** |

## REQUIRED COURSES FOR A MINOR IN CHEMISTRY

Minor in Chemistry acquired after completing 20 Semester hours. Students must complete courses with a grade of ‘C’ or better.

|  |  |  |  |
| --- | --- | --- | --- |
| **Courses** |  | **Titles** | **Credit Hrs.** |
| CHEM | 1212K | General Chemistry II | 4 |
| CHEM | 2301K | Organic Chemistry I | 4 |
| CHEM | 2302K | Organic Chemistry II | 4 |
| CHEM | 3250K | Biochemistry | 4 |
| CHEM | 2351K | Quant. Analysis I or other 2000 level or higher chemistry course | 4 |
| Total |  |  | (20 hours) |

## REQUIRED COURSES FOR PRE-ENGINEERING AND DUAL DEGREE PROGRAMS

The program is structured to transfer students specifically to Georgia Institute of Technology but may equally be useful to transfer to any other ABET accredited engineering program. The minimum course requirement imposed by Georgia Tech for both RETP and Dual Degree programs is dependent on the type of engineering major students choose. However, additional courses are required by Albany State University before granting recommendation for transfer which guarantees placement in the junior year at Georgia Tech. The following course list is designed for RETP transfer. Dual Degree transfer students have to complete additional courses. However, at any time, students can, on their own, apply to Georgia Tech without completing the recommended courses and may get admitted.

**Engineering Majors in Georgia Institute of Technology:**

AE– Aerospace Engineering , BME– Biomedical Engineering, ChE – Chemical Engineering, CE – Civil Engineering’ EnvE – Environmental Engineering, EE – Electrical Engineering, CmpE – Computer Engineering, ISyE – Industrial & Systems Engineering, MSE – Materials Science Engineering, ME – Mechanical Engineering, NRE – Nuclear and Radiological Engineering, PTFE – Polymer, Textile & Fiber Engineering

|  |  |  |  |
| --- | --- | --- | --- |
| **Courses** |  |  | **Engineering Major** |
| **GA TECH RETP Required Courses** | | |
| BIOL | 1111K | Biology I | BME, ChE |
| MATH | 1211 | Calculus I | Required for all Engineering Majors |
| MATH | 2212 | Calculus II | Required for all Engineering Majors |
| MATH | 2213 | Calculus III | Required for all Engineering Majors |
| MATH | 3211 | Differential Equations | AE, BME, ChE, CE, EnvE, EE, CmpE, MSE, ME, NRE, PTFE |
| MATH | 2111 | Linear Algebra | Required for all Engineering Majors |
| CHEM | 1211K | Chemistry I | AE, BME, ChE, CE, EnvE, EE, CmpE, MSE, ME, NRE, PTFE |
| CHEM | 1212K | Chemistry II | ChE, EnvE, MSE, PTFE |
| PHYS | 2221K | Physics I | Required for all Engineering Majors |
| PHYS | 2222K | Physics II | Required for all Engineering Majors |
| Science Elective I | |  | AE, CE, EnvE, EE, CmpE, ISyE, ME, NRE, |
| Science Elective II | |  | ISyE |
| ENGL | 1101 | English Comp I | Required for all Engineering Majors |
| ENGL | 1102 | English Comp II | Required for all Engineering Majors |
| ASU RETP Required Courses | | |  |
| POLS | 1101 | US & GA Gov | Required for all Engineering Majors |
| ECON 2105 or 2106 Macro or Microeconomics | | | Required for all Engineering Majors |
| ENGR | 1200 | Engineering Computing | Required for all Engineering Majors |
| ENGR | 1203 | Engineering Graphics | AE, CE, ME |
| ENGR | 1103 | Princ. of Eng. Analysis & Design | Required for all Engineering Majors |
| ENGR | 2001 | Intro. to Engineering Materials | Required for all Engineering Majors |
| ENGR | 2201 | Engineering Statics | Required for all Engineering Majors |
| CSCI | 2030 | Intro. to Comp. Engineering | EE, CmpE |
| MATH | 3112 | Discrete Mathematics | ISyE |
| MATH | 3314 | Mathematical Statistics | AE, BME, CE, EE, CmpE, ME |
| PSYC | 1101 | General Psychology | ISyE |
| CHEM | 2301K | Organic Chemistry I | BME, ChE |
| CHEM | 2302K | Organic Chemistry II | ChE |
| CHEM | 3221K | Physical Chemistry I | ChE |
| CHEM | 3222K | Physical Chemistry II | ChE |
| CHEM | 3250 | Biochemistry) | BME |

1. Science electives may be selected from Chemistry, Biology, Physics, Earth and Atmospheric Science, or other courses approved by the engineering school.
2. Students may need to take College Algebra (MATH 1111) & Pre-Calculus (MATH 1113) in order to take Calculus I (MATH 1211)
3. In order to guarantee transfer to Georgia Institute of Technology under Regents Engineering Transfer Program (RETP), a student must successfully finish the entire curriculum as described above and secure an overall GPA of at least 2.7 as well as Mathematics and Science GPA of at least 2.7.
4. As Georgia Tech follows a no forgiveness policy, in calculating GPA, grades in all courses are counted including those taken at other institutions and those repeated here at Albany State University in order to improve the previous grade.

## Dual Degree Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Additional Chemistry Courses Required for Dual Degree in Chemistry** | | | |  |
| **Required Chemistry Courses** | | | **Credits** | **Semester Offered** |
| CHEM | 1211K | General Chemistry I | 4 | Fall and Spring |
| CHEM | 1212K | General Chemistry II | 4 | Fall, Spring, Summer |
| CHEM | 2301K | Organic Chemistry I | 4 | Fall and Spring |
| CHEM | 2302K | Organic Chemistry II | 4 | Fall and Spring |
| CHEM | 2351K | Quantitative Analysis I | 4 | Fall |
| CHEM | 2352K | Quantitative Analysis II | 4 | Spring |
| CHEM | 3221K | Physical Chemistry I | 4 | Spring |
| CHEM | 3222K | Physical Chemistry II | 4 | Fall |
| Chemistry | Electives | (2000 level or higher) | 5 |  |
| **Total** | **Chemistry** | **Credit Hours Required** | **(37 hours)** |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Additional Courses Required for Dual Degree in Computer Science for Computer Engineering Majors** | | | | | | | | | |
|  |  |  |  | |  | | |  | |
| ALBANY STATE UNIVERSITY | | | | HOURS | | GEORGIA TECH SUBSTITUTIONS | HOURS | |
| CSCI | 1301 | COMPUTER SCIENCE I | 4 | |  | | |  | |
| CSCI | 1302 | COMPUTER SCIENCE II | 4 | |  | | |  | |
| CSCI | 3111 | DISCRETE STRUCTURES | 3 | |  | | |  | |
| CSCI | 3122 | DATA STRUCTURES | 3 | |  | | |  | |
| CSCI | 4113 | OPERATING SYSTEMS & | 3 | | ECE 3055 COMPUTER ARCHITECTURE AND | | | | |
| CSCI | 3212 | COMP. ORG. & ARCH. II | 3 | | OPERATING SYSTEMS | | | 4 | |
| CSCI | 4123 | COMP. NETWORKS | 3 | | ECE 3076 COMPUTER COMMUNICATIONS | | | 3 | |
| CSCI | 3211 | COMP. ORG. & ARCH. I | 3 | | ECE 2031 DIGITAL DESIGN LAB | | | 3 | |
| CSCI | 4151 | SYS SIMULATION | 3 | | ISYE 3044 SIMUL. ANAL. & DESIGN | | | 3 | |
| CSCI | 4311 | COMPUTER GRAPHICS | 3 | |  | | |  | |
| CSCI | 4221 | SOFTWARE ENGINEERING | 3 | |  | | |  | |
| MATH | 2212 | CALCULUS II | 3 | |  | | |  | |
| MATH | 2213 | CALCULUS III | 3 | |  | | |  | |
| MATH | 2111 | LINEAR ALGEBRA | 3 | |  | | |  | |
| MATH | 3423 | INTRO TO OPERATIONS RESEARCH | 3 | |  | | |  | |
| **TOTAL HOURS** | |  | **(47 hrs)** | |  | | | **(13 hrs)** | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Courses Required for Dual Degree in Mathematics** | | |  |  |
| **Courses** |  |  |  | **Hours** |
| Calculus I, II, III | |  |  | 12 |
| Basic Statistics | |  |  | 3 |
| MATH | 4211 | Elements of Analysis I | | 3 |
| MATH | 4111 | Modern Algebra I | | 3 |
| MATH | 3314 | Math Statistics | | 3 |
| MATH | 3211 | Ordinary Differential Equations | | 3 |
| MATH | 3423 | Introduction to Operations Research | | 3 |
| MATH | 3213 | Modern Geometry | | 3 |
| MATH | 3411 | Statistical Methods | | 3 |
| MATH | 3101 | Introduction to Number Theory | | 3 |
| MATH | 4215 | Numerical Analysis | | 3 |
| MATH | 3112 | Discrete Mathematics | | 3 |
| MATH | 2111 | Linear Algebra | | 3 |
| **Total** |  |  |  | **(48 hrs)** |

