

GENETICS - BS

Curriculum in Genetics is administered by the Department of Biochemistry and Biophysics.

Genetics is one of the most exciting, rapidly expanding areas in the life sciences. More than an independent discipline, it has become the basis for understanding many aspects of medical and agricultural systems, animal and plant diseases, and even animal behavior. Developments in molecular genetics have provided biotechnologies that will dramatically affect our lives from the improved diagnosis of human disease, to the production of viral-resistant crops, to environmental cleanup.

The undergraduate curriculum in genetics allows the study of several different aspects of genetics, including population genetics, human genetics and genetic engineering. The genetics major is designed to develop the knowledge and skills necessary for advanced studies in all disciplines related to life sciences from medicine/veterinary medicine to genetic engineering. This basic science curriculum also has enough flexibility to allow a student to prepare for such diverse careers as forensics, medicine, business or law.

Program Requirements

First Year

| Fall | | Semester Credit Hours |
|---|--|-----------------------|
| CHEM 119 | Fundamentals of Chemistry I | 4 |
| ENGL 104 | Composition and Rhetoric | 3 |
| GENE 101/ BICH 101 | Perspectives in Biochemistry and Genetics | 1 |
| MATH 151 or MATH 171 | Engineering Mathematics I or Calculus I | 4 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ¹ | | 3 |
| Semester Credit Hours | | 15 |

Spring

| | | |
|------------------------------|--|-----------|
| BIOL 111 | Introductory Biology I | 4 |
| CHEM 120 | Fundamentals of Chemistry II | 4 |
| MATH 152 or MATH 172 | Engineering Mathematics II or Calculus II | 4 |
| Select one of the following: | | 3 |
| ENGL 203 | Writing about Literature | |
| ENGL 210 | Technical and Professional Writing | |
| COMM 203 | Public Speaking | |
| COMM 205 | Communication for Technical Professions | |
| Semester Credit Hours | | 15 |

Second Year

| Fall | | |
|------------------------------|------------------------------|-----------|
| BIOL 112 | Introductory Biology II | 4 |
| CHEM 227 | Organic Chemistry I | 3 |
| CHEM 237 | Organic Chemistry Laboratory | 1 |
| PHYS 201 | College Physics | 4 |
| STAT 211 | Principles of Statistics I | 3 |
| Semester Credit Hours | | 15 |

Spring

| | | |
|------------------------------|-----------------------------------|-----------|
| CHEM 228 | Organic Chemistry II | 3 |
| CHEM 238 | Organic Chemistry Laboratory | 1 |
| GENE 302 | Principles of Genetics | 3 |
| GENE 314 | Principles of Genetics Laboratory | 1 |
| PHYS 202 | College Physics | 4 |
| STAT 212 | Principles of Statistics II | 3 |
| Semester Credit Hours | | 15 |

Third Year

| Fall | | |
|---|---|-----------|
| BICH 409 | Principles of Biochemistry ² | 3 |
| BIOL 351 | Fundamentals of Microbiology | 4 |
| GENE 491 | Research | 2 |
| STAT 404 | Statistical Computing | 3 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ¹ | | 3 |
| General elective ³ | | 2 |
| Semester Credit Hours | | 17 |

Spring

| | | |
|---|--|-----------|
| GENE 412 | Population, Quantitative and Ecological Genetics | 3 |
| GENE 431/ BICH 431 | Molecular Genetics | 3 |
| GENE 491 | Research ⁴ | 2 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ¹ | | 6 |
| Genetics elective ⁵ | | 3 |
| Semester Credit Hours | | 17 |

Fourth Year

| Fall | | |
|---|---|-----------|
| BICH 450/ BIOL 450 | Genomics | 4 |
| GENE 419/ BICH 419 | Computational Techniques for Evolutionary Analysis | 3 |
| GENE 432/ BICH 432 or BICH 414 | Laboratory in Molecular Genetics or Biochemical Techniques I | 2 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ¹ | | 3 |
| Semester Credit Hours | | 12 |

Spring

| | | |
|---|--|------------|
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ¹ | | 6 |
| Genetics elective ⁵ | | 3 |
| General elective ³ | | 5 |
| Semester Credit Hours | | 14 |
| Total Semester Credit Hours | | 120 |

¹ To be selected from the University Core Curriculum. Of the 21 hours shown as University Core Curriculum courses, 3 must be from Language, Philosophy and Culture (<http://catalog.tamu.edu/>)

undergraduate/general-information/university-core-curriculum/);
 3 from Creative Arts (<http://catalog.tamu.edu/gened:creative-arts>);
 3 from Social and Behavioral Sciences (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/>);
 and the American History (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/>) requirements if they are also on the approved list of International and Cultural Diversity (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>)/Cultural Discourse (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>) courses.

² Before Registration in BICH 409, students must have attained a grade of C or better in the following courses: CHEM 227, CHEM 237, CHEM 228, and CHEM 238.

³ Often used for a minor. Students intending to pursue and advance degree in Genetics are strongly urged to use some General Electives for additional upper division courses in GENE, BICH, BIOL, CHEM, MATH or STAT. General Electives may be any course numbered 100-499 that is not used elsewhere (Except: BICH 303, BICH 410, BICH 411, BICH 412, BICH 440, BICH 441; MATH 100-104 (<http://catalog.tamu.edu/undergraduate/course-descriptions/math/>), MATH 130-148 (<http://catalog.tamu.edu/undergraduate/course-descriptions/math/>)).

⁴ The fourth registered hour of research must be taken as Writing Intensive.

⁵ Hours to be selected from any 400-level course in GENE with approval of student's Academic Advisor. Excludes: BICH 409, BICH 410, BICH 411, BICH 414, BICH 431/GENE 431, BICH 432/GENE 432, BICH 440, BICH 491, GENE 412, GENE 419/BICH 419, GENE 491.

Students must make a grade of C or better in all major coursework used to satisfy the degree plan.