GENETICS - BS

The program 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.

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. 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**
BIOL 111	Introductory Biology I	4
CHEM 119	Fundamentals of Chemistry I	4
GENE 101/ BICH 101	Introduction to Biochemical and Genetics Research Methods [1]	1
MATH 151 or MATH 171	Engineering Mathematics I or Calculus I	4
University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [2]		3
	Semester Credit Hours	**16**
Spring		
BIOL 112	Introductory Biology II	4
CHEM 120	Fundamentals of Chemistry II	4
ENGL 104 or ENGL 103	Composition and Rhetoric or Introduction to Rhetoric and Composition	3
GENE 102/ BICH 102	Introduction to Biochemical and Genetic Techniques [1]	1
MATH 152 or MATH 172	Engineering Mathematics II or Calculus II	4
	Semester Credit Hours	**16**

Second Year

Fall		
GENE 201/ BICH 201	Introduction to Information Literacy and Artificial Intelligence Tools for Biochemistry and Genetics [1]	1
Select one of the following: [1]		4
CHEM 227 & CHEM 237	Organic Chemistry I and Organic Chemistry Laboratory	
CHEM 257	Organic Chemistry I - Structure and Function	
Select one of the following:		3
COMM 203	Public Speaking	
COMM 205	Communication for Technical Professions	
COMM 243	Argumentation and Debate	
ENGL 203	Writing about Literature	
ENGL 210	Technical and Professional Writing	
University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [2]		3
General elective [5]		3
	Semester Credit Hours	**14**
Spring		
GENE 202/ BICH 202	Biochemical and Genetic Concepts in Medicine - Case Studies [1]	1
GENE 303 or GENE 302	Fundamentals of Genetics [1] or Principles of Genetics	3
GENE 314	Principles of Genetics Laboratory [1]	1
GENE 491	Research [1]	1
STAT 312	Statistics for Biology	3
Select one of the following: [1]		4
CHEM 228 & CHEM 238	Organic Chemistry II and Organic Chemistry Laboratory	
CHEM 258	Organic Chemistry II - Reactivity and Applications	
University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [2]		3
	Semester Credit Hours	**16**

Third Year

Fall		
BICH 409	Principles of Biochemistry [1]	3
BIOL 351	Fundamentals of Microbiology	4
GENE 491	Research [1]	1
PHYS 201	College Physics	4
General elective [5]		2
	Semester Credit Hours	**14**
Spring		
GENE 431/ BICH 431	Molecular Genetics [1]	3
GENE 491	Research [1]	1
PHYS 202	College Physics	4
Select one of the following:		3
GENE 412	Population, Quantitative and Ecological Genetics [1]	
Genetics elective [1,4]		
University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [2]		3
General elective [5]		1
	Semester Credit Hours	**15**

Fourth Year		
Fall		
GENE 419/ BICH 419	Computational Techniques for Evolutionary Analysis [1]	3
GENE 432/ BICH 432 or BICH 414	Laboratory in Molecular Genetics [1] or Biochemical Techniques I	2
GENE 491	Research [1,3]	1
University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [2]		6
Genetics elective [1,4]		3
	Semester Credit Hours	**15**
Spring		
Select one of the following: [1]		3
BICH 450/ BIOL 450	Genomics	
BIOL 349	Bioinformatics	
BIOL 350	Computational Genomics	
GENE 464/ BICH 464 or BICH 464/ GENE 464	Bacteriophage Genomics or Bacteriophage Genomics	
STAT 446	Statistical Bioinformatics	
VTPP 438	Analysis of Genomic Signals	
University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [2]		3
Genetics elective [1,4]		3
General elective [5]		5
	Semester Credit Hours	**14**
	Total Semester Credit Hours	**120**

1. Must make a grade of C or better.
2. To be selected from the University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/). Of the 21 hours shown as University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) electives, 3 hours must be from language, philosophy and culture, 3 hours from creative arts, 3 hours from social and behavioral sciences, 6 hours from American history, 6 hours from POLS 206 and POLS 207. The graduation requirements include a requirement for 3 hours of International and Cultural Diversity (https://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/) courses and 3 hours of Cultural Discourse (https://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/) courses which may be met by courses satisfying the language, philosophy and culture, creative arts, social and behavioral sciences, government/political science and American history requirements if they are also on the approved list of international and cultural diversity courses.
3. The fourth registered hour of research must be taken as Writing Intensive.
4. Hours to be selected from any 400-level course in Genetics (https://catalog.tamu.edu/undergraduate/course-descriptions/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.
5. Often used for a minor. Students intending to pursue an 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 (https://catalog.tamu.edu/undergraduate/course-descriptions/math/), MATH 130-148 (https://catalog.tamu.edu/undergraduate/course-descriptions/math/); STAT 201).