MOLECULAR AND CELL BIOLOGY - BS

Students who select Molecular and Cell Biology as their major will receive a strong background in the cellular and molecular aspects of biology with particular emphasis on eukaryotes. The major provides an excellent foundation for a career in biotechnology, genetic engineering, MD/PhD programs or basic biological research.

Program Requirements

First Year

Fall		Semester Credit Hours
BIOL 111	Introductory Biology I [1,2]	4
CHEM 119	Fundamentals of Chemistry I [2]	4
Select one of the following: [2,3]		4
MATH 147	Calculus I for Biological Sciences	
MATH 151	Engineering Mathematics I	
MATH 171	Calculus I	
Communication (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication)		3
	Semester Credit Hours	**15**
Spring		
BIOL 112	Introductory Biology II [1, 2]	4
CHEM 120	Fundamentals of Chemistry II [2]	4
Select one of the following: [2]		3-4
MATH 148	Calculus II for Biological Sciences	
MATH 152	Engineering Mathematics II	
MATH 172	Calculus II	
STAT 201	Elementary Statistical Inference	
Communication (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication)		3
	Semester Credit Hours	**14**

Second Year

Fall		
BIOL 213	Molecular Cell Biology [2]	3
CHEM 227 & CHEM 237	Organic Chemistry I and Organic Chemistry Laboratory [2]	4
PHYS 201	College Physics	4
American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history) [4,5]		3
	Semester Credit Hours	**14**
Spring		
BIOL 214	Genes, Ecology and Evolution [2]	3
CHEM 228 & CHEM 238	Organic Chemistry II and Organic Chemistry Laboratory [2]	4
PHYS 202	College Physics	4
American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history) [4,5]		3
	Semester Credit Hours	**14**
	Total Semester Credit Hours	**57**

1. Grade of C or better required.
2. Must be completed by start of 5th full semester.
3. Students may not use MATH 142 to satisfy this requirement.
4. Students seeking teacher certification must take HIST 105 and HIST 106. Other students may choose HIST 105 and HIST 106 or any 6 hours of American history courses (3 hours may be in Texas history).
5. Students successfully completing the required four semesters of upper-level ROTC courses may substitute these courses for 3 hours of American history and 3 hours of government/political science.

The following are CBK courses and must be completed prior to the start of 5th full semester: BIOL 111, BIOL 112, BIOL 213, BIOL 214, CHEM 119 , CHEM 120 , CHEM 227 & CHEM 237, CHEM 228 & CHEM 238, MATH 147, MATH 148 or STAT 201.

Third Year

Fall		Semester Credit Hours
BICH 410 or BICH 440	Comprehensive Biochemistry I or Biochemistry I	3
BIOL 351	Fundamentals of Microbiology	4
GENE 302 & GENE 314	Principles of Genetics and Principles of Genetics Laboratory	4
STAT 312	Statistics for Biology	3
	Semester Credit Hours	**14**
Spring		
BICH 411 or BICH 441	Comprehensive Biochemistry II or Biochemistry II	3
BICH 414 or BICH 432/ GENE 432	Biochemical Techniques I or Laboratory in Molecular Genetics	2
BICH 431/ GENE 431	Molecular Genetics	3
Social and behavioral sciences (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences)		3
General elective [6]		5
	Semester Credit Hours	**16**

Fourth Year

Fall		
BIOL 413	Cell Biology	3
BIOL 414	Developmental Biology	3
BIOL 423	Cell Biology Laboratory	2
POLS 206	American National Government [5]	3
Language, philosophy and culture (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture)		3
General elective [6]		3
	Semester Credit Hours	**17**

Spring		
POLS 207	State and Local Government [5]	3
Creative arts (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts)		3
Directed electives [7, 8]		6
General elective [6]		4
	Semester Credit Hours	**16**
	Total Semester Credit Hours	**63**

[6] Select from any 100-499 course not used elsewhere. (Except AGLS 101; ASCC 101, ASCC 102, ASCC 289; BIMS 101; BIOL 101, BIOL 107, BIOL 113, BIOL 206; CHEM 106, CHEM 116; MATH 102, MATH 142.) Only one KINE 199 may be used as a general elective.

[7] Directed electives choose from list below.

[8] Two courses in the major must be designated as writing intensive.

Total Program Hours 120

Directed Electives

Code	Title	Semester Credit Hours
Select one course from the following:		
BIOL 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/biol/)		
OCNG 320	Biological Oceanography	3
Select remaining courses from the following:		
Cell Biology		
BIOL 430	Biological Imaging	4
VIBS 343	Histology	4
VIBS 443	Biology of Mammalian Cells and Tissues	4
Organismal Biology		
BIOL 344	Embryology	4
BIOL 388	Principles of Animal Physiology	4
BIOL 434/ NRSC 434	Regulatory and Behavioral Neuroscience	3
BIOL 435	Laboratory for Regulatory and Behavioral Neuroscience	1
BIOL 466	Principles of Evolution	3
BIOL 467	Integrative Animal Behavior	3
MEPS 313	Introduction to Plant Physiology	3
Molecular and Computational Biology		
BIOL 450/ BICH 450	Genomics	4
BIOL 451	Bioinformatics	3
BICH 432/ GENE 432	Laboratory in Molecular Genetics	2
CHEM 327	Physical Chemistry I	3
Microbiology		
BIOL 406/ GENE 406	Bacterial Genetics	3
BIOL 438	Bacterial Physiology	3
BIOL 445	Biology of Viruses	3
BIOL 454	Immunology	3
BIOL 455	Laboratory in Immunology	2
BIOL 456	Medical Microbiology	3