

# 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 <sup>1,2</sup>	4
CHEM 119	Fundamentals of Chemistry I <sup>2</sup>	4
Select one of the following: <sup>2,3</sup>		4
MATH 147	Calculus I for Biological Sciences	
MATH 151	Engineering Mathematics I	
MATH 171	Calculus I	
Communication ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication</a> )		3

**Semester Credit Hours 15**

### Spring

BIOL 112	Introductory Biology II <sup>1,2</sup>	4
CHEM 120	Fundamentals of Chemistry II <sup>2</sup>	4
Select one of the following: <sup>2</sup>		3-4
MATH 148	Calculus II for Biological Sciences	
MATH 152	Engineering Mathematics II	
MATH 172	Calculus II	
STAT 201	Elementary Statistical Inference	
Communication ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication</a> )		3

**Semester Credit Hours 14**

### Second Year

Fall		Semester Credit Hours
BIOL 213	Molecular Cell Biology <sup>2</sup>	3
CHEM 227 & CHEM 237	Organic Chemistry I and Organic Chemistry Laboratory <sup>2</sup>	4
PHYS 201	College Physics	4
American history ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history</a> ) <sup>4,5</sup>		3

**Semester Credit Hours 14**

### Spring

BIOL 214	Genes, Ecology and Evolution <sup>2</sup>	3
CHEM 228 & CHEM 238	Organic Chemistry II and Organic Chemistry Laboratory <sup>2</sup>	4
PHYS 202	College Physics	4

American history ( <a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history</a> ) <sup>4,5</sup>	3
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**Semester Credit Hours 14**

**Total Semester Credit Hours 57**

- Grade of C or better required.
- Must be completed by start of 5th full semester.
- Students may not use MATH 142 to satisfy this requirement.
- 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).
- 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>)

General elective <sup>6</sup>

**Semester Credit Hours 16**

### Fourth Year

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

**Semester Credit Hours 17**

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

BIOL 455	Laboratory in Immunology	2
BIOL 456	Medical Microbiology	3

<sup>6</sup> 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.

<sup>7</sup> Directed electives choose from list below.

<sup>8</sup> Two courses in the major must be designated as writing intensive.

## Total Program Hours 120

### Directed Electives

Code	Title	Semester Credit Hours
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Select one course from the following:

BIOL 300-499 (<http://catalog.tamu.edu/undergraduate/course-descriptions/biol/>)

OCNG 320	Biological Oceanography	3
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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 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
HORT 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