

MICROBIOLOGY - BS

The degree program in Microbiology is designed to provide a comprehensive education in the biology of microorganisms. A graduate of this program will have a thorough grounding in the classical areas of microbial physiology and biochemistry, microbial genetics, and developing areas like the molecular biology of microorganisms. The curriculum provides excellent training toward a career in any of the many areas of industrial microbiology and public health services. It is also an ideal preparation for advanced study or professional school in medicine, dentistry and other related fields, especially medical technology and biotechnology.

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 | | Semester Credit Hours |
|---|---|-----------------------------|
| 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 | | Semester Credit Hours |
| BIOL 214 | Genes, Ecology and Evolution ² | 3 |
| CHEM 228 & CHEM 238 | Organic Chemistry II and Organic Chemistry Laboratory ² | 4 |

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|---|-----------------|-----------|
| 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 |
| POLS 206 | American National Government ⁵ | 3 |
| Social and behavioral science (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences) | | 3 |
| General elective ⁶ | | 6 |
| Semester Credit Hours | | 17 |

Fourth Year

| Fall | | Semester Credit Hours |
|--|---|-----------------------------|
| BIOL 406/ GENE 406 | Bacterial Genetics | 3 |
| BIOL 445 or BIOL 454 | Biology of Viruses or Immunology | 3 |
| POLS 207 | State and Local Government ⁵ | 3 |
| Language, philosophy and culture (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture) | | 3 |
| Directed electives ^{7,8} | | 4 |
| Semester Credit Hours | | 16 |

| Spring | | |
|---|----------------------|-----------|
| BIOL 438 | Bacterial Physiology | 3 |
| Creative arts (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts) | | 3 |
| Directed elective ^{7,8} | | 3 |
| General elective ⁷ | | 7 |
| Semester Credit Hours | | 16 |
| Total Semester Credit Hours | | 63 |

| Molecular Microbiology | | |
|-------------------------------|-------------------------|---|
| BIOL 352 | Diagnostic Bacteriology | 4 |
| BIOL 413 | Cell Biology | 3 |
| BIOL 430 | Biological Imaging | 4 |
| BIOL 445 | Biology of Viruses | 3 |

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 Select directed electives from the 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:

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

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|----------|-------------------------|---|
| OCNG 320 | Biological Oceanography | 3 |
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Select remaining courses from the following:

Industrial Microbiology

| | | |
|-----------------------|--|---|
| BIOL 352 | Diagnostic Bacteriology | 4 |
| BIOL 414 | Developmental Biology | 3 |
| BIOL 430 | Biological Imaging | 4 |
| BIOL 450/ BICH 450 | Genomics | 4 |
| BIOL 461 | Antimicrobial Agents | 1 |
| BESC 401 | Bioenvironmental Microbiology | 3 |
| BESC 402 | Microbial Processes in Bioremediation | 3 |

Environmental Microbiology

| | | |
|----------|--|---|
| BIOL 352 | Diagnostic Bacteriology | 4 |
| BIOL 430 | Biological Imaging | 4 |
| BIOL 440 | Marine Biology | 4 |
| SCSC 405 | Soil and Water Microbiology | 3 |
| BESC 401 | Bioenvironmental Microbiology | 3 |
| BESC 402 | Microbial Processes in Bioremediation | 3 |
| BESC 403 | Sampling and Environmental Monitoring | 3 |

Medical Microbiology

| | | |
|----------|--------------------------|---|
| BIOL 352 | Diagnostic Bacteriology | 4 |
| BIOL 445 | Biology of Viruses | 3 |
| BIOL 454 | Immunology | 3 |
| BIOL 455 | Laboratory in Immunology | 2 |
| BIOL 456 | Medical Microbiology | 3 |
| VTPB 487 | Biomedical Parasitology | 4 |