

# BIOCHEMISTRY - BS

This program is designed to provide a solid background in chemistry and the physical sciences, as well as in the biological sciences.

Biochemistry is an especially versatile major giving undergraduates many options when they complete their BS degree. A biochemistry major provides a strong background for entering graduate school in a variety of fields, and the majority of biochemistry majors go on to graduate school or to professional schools such as medicine, veterinary medicine or dentistry. Biochemistry majors excel in biomedical professional schools because of their strong background in the basic sciences. In addition, a wide variety of job opportunities is open to biochemistry majors with a BS degree. Many find rewarding careers working in laboratories as research scientists, forensic scientists and technicians in clinical, governmental and university laboratories. Biochemists are also employed by diverse companies in the chemical, pharmaceutical, agricultural, food and scientific equipment industries.

## Program Requirements

### First Year

| Fall  |  | Semester Credit Hours |
|---|--|-----------------------|
| BICH 101/<br>GENE 101   | Introduction to Biochemical and Genetics Research Methods <sup>1</sup> | 1                     |
| BIOL 111  | Introductory Biology I   | 4                     |
| CHEM 119  | Fundamentals of Chemistry I  | 4                     |
| MATH 151<br>or MATH 171   | Engineering Mathematics I<br>or Calculus I                             | 4                     |
| University Core Curriculum ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>2</sup> |  | 3                     |
| <b>Semester Credit Hours</b>  |  | <b>16</b>             |

### Spring

|                              |   |           |
|------------------------------|---|-----------|
| BICH 102/<br>GENE 102        | Introduction to Biochemical and Genetic Techniques                      | 1         |
| BIOL 112                     | Introductory Biology II   | 4         |
| CHEM 120                     | Fundamentals of Chemistry II  | 4         |
| ENGL 104<br>or ENGL 103      | Composition and Rhetoric<br>or Introduction to Rhetoric and Composition | 3         |
| MATH 152<br>or MATH 172      | Engineering Mathematics II<br>or Calculus II                            | 4         |
| <b>Semester Credit Hours</b> |   | <b>16</b> |

### Second Year

| Fall                                      |  |   |
|---|--|---|
| BICH 201/<br>GENE 201                     | Introduction to Information Literacy and Artificial Intelligence Tools for Biochemistry and Genetics | 1 |
| Select one of the following: <sup>1</sup> |  | 4 |
| CHEM 227<br>& CHEM 237                    | Organic Chemistry I<br>and Organic Chemistry Laboratory  |   |
| CHEM 257                                  | Organic Chemistry I - Structure and Function   |   |

|                        |  |   |
|------------------------|--|---|
| PHYS 206<br>& PHYS 226 | Newtonian Mechanics for Engineering and Science<br>and Physics of Motion Laboratory for the Sciences | 4 |
|------------------------|--|---|

|                              |   |   |
|------------------------------|---|---|
| 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 ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>2</sup> |  | 3 |
|---|--|---|

**Semester Credit Hours 15**

### Spring

|                       |   |   |
|-----------------------|---|---|
| BICH 202/<br>GENE 202 | Biochemical and Genetic Concepts in Medicine - Case Studies | 1 |
| BICH 491              | Research  | 1 |

Select one of the following: <sup>1</sup> 4

|                        |  |  |
|------------------------|--|--|
| CHEM 228<br>& CHEM 238 | Organic Chemistry II<br>and Organic Chemistry Laboratory |  |
| CHEM 258               | Organic Chemistry II - Reactivity and Applications       |  |

|                        |  |   |
|------------------------|--|---|
| PHYS 207<br>& PHYS 227 | Electricity and Magnetism for Engineering and Science<br>and Electricity and Magnetism Laboratory for the Sciences | 4 |
|------------------------|--|---|

|   |  |   |
|---|--|---|
| University Core Curriculum ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>2</sup> |  | 3 |
|---|--|---|

**Semester Credit Hours 13**

### Third Year

| Fall  |   |   |
|---|---|---|
| BICH 440  | Biochemistry I <sup>1</sup>                           | 3 |
| BICH 404  | Biochemical Calculations <sup>1</sup>                 | 2 |
| BICH 491  | Research <sup>1</sup>                                 | 1 |
| CHEM 321  | Physical Chemistry for Life Sciences                  | 3 |
| GENE 303<br>or GENE 302   | Fundamentals of Genetics<br>or Principles of Genetics | 3 |
| GENE 314  | Principles of Genetics Laboratory                     | 1 |
| University Core Curriculum ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>2</sup> |   | 3 |

**Semester Credit Hours 16**

### Spring

|                                      |  |   |
|--------------------------------------|--|---|
| BICH 414<br>or BICH 432/<br>GENE 432 | Biochemical Techniques I <sup>1</sup><br>or Laboratory in Molecular Genetics | 2 |
|--------------------------------------|--|---|

|          |                              |   |
|----------|------------------------------|---|
| BICH 441 | Biochemistry II <sup>1</sup> | 3 |
| BICH 491 | Research <sup>1</sup>        | 1 |

|                         |  |   |
|-------------------------|--|---|
| STAT 302<br>or STAT 312 | Statistical Methods<br>or Statistics for Biology | 3 |
|-------------------------|--|---|

|   |  |   |
|---|--|---|
| University Core Curriculum ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>2</sup> |  | 3 |
|---|--|---|

|   |            |
|---|------------|
| General elective <sup>3</sup>   | 3          |
| <b>Semester Credit Hours</b>  | <b>15</b>  |
| <b>Fourth Year</b>  |            |
| <b>Fall</b>   |            |
| BICH 431/ Molecular Genetics <sup>1</sup><br>GENE 431   | 3          |
| BICH 491 Research <sup>1</sup>  | 1          |
| BIOL 351 Fundamentals of Microbiology   | 4          |
| Biochemistry elective <sup>5</sup>  | 3          |
| General elective <sup>3</sup>   | 3          |
| <b>Semester Credit Hours</b>  | <b>14</b>  |
| <b>Spring</b>   |            |
| University Core Curriculum ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a> ) <sup>2</sup> | 6          |
| Biochemistry elective <sup>5</sup>  | 3          |
| General elective <sup>3</sup>   | 6          |
| <b>Semester Credit Hours</b>  | <b>15</b>  |
| <b>Total Semester Credit Hours</b>  | <b>120</b> |

<sup>1</sup> Must make a grade of C or better.

<sup>2</sup> 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 must be from language, philosophy and culture, 3 from creative arts, 3 from social and behavioral sciences, 6 from American history, 6 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 Core Curriculum requirements if they are also on the approved list of international and cultural diversity courses.

<sup>3</sup> Select from any course 100-499 not used elsewhere (except BICH 303, BICH 410-412 (<https://catalog.tamu.edu/undergraduate/course-descriptions/bich/>); MATH 100-104, 131-148 (<https://catalog.tamu.edu/undergraduate/course-descriptions/math/>); STAT 201). Often used for a minor. Students intending to pursue an advanced degree in biochemistry are strongly encouraged to use some free electives for additional upper division courses in BICH (<https://catalog.tamu.edu/undergraduate/course-descriptions/bich/>), GENE (<https://catalog.tamu.edu/undergraduate/course-descriptions/gene/>), BIOL (<https://catalog.tamu.edu/undergraduate/course-descriptions/biol/>), CHEM (<https://catalog.tamu.edu/undergraduate/course-descriptions/chem/>), MATH (<https://catalog.tamu.edu/undergraduate/course-descriptions/math/>) or STAT (<https://catalog.tamu.edu/undergraduate/course-descriptions/stat/>).

<sup>4</sup> The fourth registered hour of research must be taken as writing intensive.

<sup>5</sup> Hours to be selected from any 400-level course in Biochemistry with approval of student's academic advisor. BICH 404, BICH 414, BICH 431/GENE 431, BICH 432/GENE 432, BICH 440, BICH 441, or BICH 491 may not be used to satisfy this requirement.