## **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**

| Fall   |   | Semester<br>Credit<br>Hours |
|--|---|-----------------------------|
| BICH 101/<br>GENE 101  | Introduction to Biochemical and Genetics<br>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 or Calculus I                                   | 4                           |
| University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) <sup>2</sup> |   | 3                           |
| ·  | 1.0   |                             |

|                               | Semester Credit Hours  | 16        |
|-------------------------------|--|-----------|
| 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<br>Composition                                 | 3         |
| MATH 152<br>or MATH 172       | Engineering Mathematics II or Calculus II  | 4         |
|                               |  |           |
|                               | Semester Credit Hours  | 16        |
| Second Year                   | Semester Credit Hours  | 16        |
| Second Year<br>Fall           | Semester Credit Hours  | 16        |
|                               | Introduction to Information Literacy and Artificial Intelligence Tools for Biochemistry and Genetics       | <b>16</b> |
| Fall<br>BICH 201/             | Introduction to Information Literacy and<br>Artificial Intelligence Tools for Biochemistry<br>and Genetics |           |
| Fall<br>BICH 201/<br>GENE 201 | Introduction to Information Literacy and<br>Artificial Intelligence Tools for Biochemistry<br>and Genetics | 1         |

| Sciences  Select one of the following:  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/) Semester Credit Hours  Spring  BICH 202/ Biochemical and Genetic Concepts in GENE 202 Medicine - Case Studies  BICH 491 Research 1  Select one of the following: 4  CHEM 228 Organic Chemistry II  & CHEM 238 and Organic Chemistry II - Reactivity and Applications  PHYS 207 Electricity and Magnetism for Engineering 4  & PHYS 227 and Science and Electricity and Magnetism Laboratory  for the Sciences  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) Semester Credit Hours 13  BICH 440 Biochemistry I 1  BICH 440 Biochemistry I 1  BICH 440 Biochemistry I 1  BICH 491 Research 1  CHEM 321 Physical Chemistry for Life Sciences  GENE 303 Fundamentals of Genetics  or GENE 302 or Principles of Genetics  GENE 303 Fundamentals of Genetics  GENE 304 Principles of Genetics Laboratory  Iniversity Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) Semester Credit Hours 1  Diviversity Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) Semester Credit Hours 1  Semester Credit Hours 1  Semester Credit Hours 1  Or BICH 432 or Laboratory in Molecular Genetics  GENE 302 Statistical Methods 3  or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum() 2  Semester Credit Hours 3  Or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core | PHYS 206<br>& PHYS 226   | Newtonian Mechanics for Engineering and<br>Science<br>and Physics of Motion Laboratory for the   | 4                                     |
|--|--|--|---------------------------------------|
| 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  Semester Credit Hours 15  Spring BICH 202/ Biochemical and Genetic Concepts in GENE 202 Medicine - Case Studies BICH 491 Research 1 Select one of the following: 4 CHEM 228 Organic Chemistry II & CHEM 228 Organic Chemistry II - Reactivity and Applications CHEM 258 Organic Chemistry II - Reactivity and Applications PHYS 207 Electricity and Magnetism for Engineering 4 R. PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 13 BICH 404 Biochemistry I 1 3 BICH 404 Biochemical Calculations 1 2 BICH 491 Research 1 1 CHEM 321 Physical Chemistry for Life Sciences 3 GENE 303 Fundamentals of Genetics 3 GENE 303 Fundamentals of Genetics 3 GENE 303 Fundamentals of Genetics 3 GENE 304 Principles of Genetics Laboratory 1 1 University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16 Spring BICH 414 Biochemistry II 1 2 or BICH 432 or Laboratory 1 1 Diversity Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16 Spring BICH 414 Biochemistry II 1 3 BICH 491 Research 1 1 Semester Credit Hours 1 3 BICH 491 Research 1 1 BICH 491 Research 1 1 2 Or BICH 4322 or Laboratory in Molecular Genetics GENE 312 or Statistics for Biology University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-  |  |  |                                       |
| 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  Semester Credit Hours 15  Spring BICH 202/ Biochemical and Genetic Concepts in GENE 202 Medicine - Case Studies BICH 491 Research 1  Select one of the following: 1  CHEM 228 Organic Chemistry II  & CHEM 238 and Organic Chemistry Laboratory CHEM 258 Organic Chemistry II - Reactivity and Applications PHYS 207 Electricity and Magnetism for Engineering 4  & PHYS 227 and Electricity and Magnetism Laboratory for the Sciences University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 13  Third Year Fall BICH 440 Biochemistry I 1  BICH 440 Biochemistry I 2  BICH 491 Research 1 1  CHEM 321 Physical Chemistry of Life Sciences 3  GENE 303 Fundamentals of Genetics 3  or GENE 303 Fundamentals of Genetics 3  or GENE 304 Principles of Genetics 4  GENE 305 Fundamentals of Genetics 4  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring BICH 414 Biochemical Techniques I 1  or BICH 432/ or Laboratory in Molecular Genetics GENE 32  BICH 441 Biochemistry II 1  semester Credit Hours 16  Spring BICH 441 Biochemistry II 1  semester Credit Hours 17  Semester Credit Hours 16  Spring BICH 441 Biochemistry II 1  semester Credit Hours 17  Semester Credit Hours 18  Semester Credit Hours 19  Semester Credit Hours 19  Semes | Select one of the  | following:   | 3                                     |
| 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  Semester Credit Hours 15  Spring  BICH 202/ Biochemical and Genetic Concepts in GENE 202 Medicine - Case Studies BICH 491 Research 1  Select one of the following: 4  CHEM 228 Organic Chemistry II  & CHEM 228 Organic Chemistry II  & CHEM 258 Organic Chemistry II - Reactivity and Applications  PHYS 207 Electricity and Magnetism for Engineering 4  & PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 13  Third Year  Fall  BICH 440 Biochemistry I 1 3  BICH 491 Research 1 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 303 Fundamentals of Genetics or GENE 303 Fundamentals of Genetics  GENE 314 Principles of Genetics  GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1 2  OR BICH 432/ or Laboratory II 1 3  BICH 441 Biochemistry II 1 3  BICH 441 Bioche | COMM 203   | Public Speaking  |                                       |
| 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  Semester Credit Hours 15  Spring  BICH 202/ Biochemical and Genetic Concepts in GENE 202 Medicine - Case Studies BICH 491 Research 1  Select one of the following: 1  CHEM 228 Organic Chemistry II & CHEM 238 and Organic Chemistry Laboratory CHEM 258 Organic Chemistry II - Reactivity and Applications PHYS 207 Electricity and Magnetism for Engineering 4 & PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 13  Third Year Fall  BICH 440 Biochemistry I 1  BICH 440 Biochemistry I 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 303 Fundamentals of Genetics 3  or GENE 304 Principles of Genetics 13  GENE 305 Fundamentals of Genetics 33  or GENE 307 Fundamentals of Genetics 33  or GENE 308 Fundamentals of Genetics 34  GENE 309 Fundamentals of Genetics 35  GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ 30  undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemistry II 1  3 Semester Credit Hours 16  Spring  BICH 441 Biochemistry II 1  3 Semester Credit Hours 16  Spring  BICH 441 Biochemistry II 1  3 SEMESTAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 30  undergraduate/general-information/university-core- curriculum (https://catalog.tamu.edu/ 31  undergraduate/general-information/university-core-   | COMM 205   | Communication for Technical Professions  |                                       |
| ENGL 210 Technical and Professional Writing University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 15  Spring  BICH 202/ Biochemical and Genetic Concepts in GENE 202 Medicine - Case Studies BICH 491 Research 1 Select one of the following: 1 CHEM 228 Organic Chemistry II & CHEM 258 Organic Chemistry II - Reactivity and Applications PHYS 207 Electricity and Magnetism for Engineering 4 & PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curricullum/) 2  Semester Credit Hours 13  Third Year Fall BICH 440 Biochemistry I 2 BICH 491 Research 1 CHEM 321 Physical Chemistry for Life Sciences 3 GENE 303 Fundamentals of Genetics 3 or GENE 302 or Principles of Genetics Caboratory 1 University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16 Spring BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432 BICH 441 Biochemistry II 3 BICH | COMM 243   | Argumentation and Debate   |                                       |
| University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours  BICH 202/ Biochemical and Genetic Concepts in GENE 202 Medicine - Case Studies  BICH 491 Research  Select one of the following: 1  CHEM 228 Organic Chemistry II & CHEM 238 and Organic Chemistry Laboratory CHEM 258 Organic Chemistry II - Reactivity and Applications  PHYS 207 Electricity and Magnetism for Engineering & PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curricullum/) 2  Semester Credit Hours  13  BICH 440 Biochemistry I 1  BICH 440 Biochemical Calculations 1  BICH 491 Research 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 303 Fundamentals of Genetics GENE 304 Principles of Genetics GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 1  BICH 491 Research 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 302 or Principles of Genetics GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1  2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1  3 BICH 491 Research 1  STAT 302 Statistical Methods 3  or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-   | ENGL 203   | Writing about Literature   |                                       |
| undergraduate/general-information/university-core- curricullum/) 2  Semester Credit Hours  15  Spring  BICH 202/ Biochemical and Genetic Concepts in GENE 202 Medicine - Case Studies  BICH 491 Research  CHEM 228 Organic Chemistry II & CHEM 238 and Organic Chemistry Laboratory  CHEM 258 Organic Chemistry II - Reactivity and Applications  PHYS 207 Electricity and Magnetism for Engineering 4 Applications  PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curricullum/) 2  Semester Credit Hours  13  Third Year  Fall  BICH 440 Biochemistry I 1  BICH 491 Research 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 303 Fundamentals of Genetics  GENE 303 Fundamentals of Genetics  GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curricullum/) 2  Semester Credit Hours 1  BICH 414 Biochemical Techniques I 1  Or BICH 432/ or Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 1  BICH 414 Biochemical Techniques I 1  Or BICH 432/ or Laboratory in Molecular Genetics  GENE 432  BICH 441 Biochemistry II 1  SEMESTAT 302 Statistical Methods 3  or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 3  undergraduate/general-information/university-core-   | ENGL 210   | Technical and Professional Writing   |                                       |
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| BICH 202/ Biochemical and Genetic Concepts in GENE 202 Medicine - Case Studies  BICH 491 Research 1  Select one of the following:  CHEM 228 Organic Chemistry II & 4  CHEM 238 and Organic Chemistry Laboratory CHEM 258 Organic Chemistry II - Reactivity and Applications  PHYS 207 Electricity and Magnetism for Engineering Applications  PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-curriculum/)  Semester Credit Hours 13  Third Year  Fall  BICH 440 Biochemistry I 3  BICH 491 Research 1 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 303 Fundamentals of Genetics 3  or GENE 302 or Principles of Genetics GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core-curriculum/)  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 2  or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 3  BICH 441 Biochemistry II 3  BICH 441 Biochemistry II 3  STAT 302 Statistical Methods 3  or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core-  |  | Semester Credit Hours  | 15                                    |
| GENE 202 Medicine - Case Studies BICH 491 Research 1 Select one of the following: 1 CHEM 228 Organic Chemistry II & CHEM 238 and Organic Chemistry Laboratory CHEM 258 Organic Chemistry II - Reactivity and Applications PHYS 207 Electricity and Magnetism for Engineering 4 & PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-curriculum/) 2 Semester Credit Hours 13 BICH 440 Biochemistry I 3 BICH 491 Research 1 1 CHEM 321 Physical Chemistry for Life Sciences 3 GENE 303 Fundamentals of Genetics 3 or GENE 302 or Principles of Genetics GENE 314 Principles of Genetics Laboratory 1 University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-curriculum/) 2 Semester Credit Hours 16 Spring BICH 414 Biochemical Techniques I 2 GENE 432 BICH 441 Biochemistry II 3 BIC | Spring   |  |                                       |
| Select one of the following: 1 CHEM 228 Organic Chemistry II & CHEM 238 and Organic Chemistry Laboratory CHEM 258 Organic Chemistry II - Reactivity and Applications PHYS 207 Electricity and Magnetism for Engineering 4 Applications PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-curriculum/) 2 Semester Credit Hours 13 BICH 440 Biochemistry I 1 3 BICH 491 Research 1 1 CHEM 321 Physical Chemistry for Life Sciences 3 GENE 303 Fundamentals of Genetics 3 or GENE 302 or Principles of Genetics 3 GENE 303 Fundamentals of Genetics 4 GENE 304 Principles of Genetics Laboratory 1 University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-curriculum/) 2 Semester Credit Hours 16 Spring BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432 BICH 441 Biochemistry II 1 3 BICH 441 Biochemi |  |  | 1                                     |
| CHEM 228   | BICH 491   | Research   | 1                                     |
| CHEM 228   | Select one of the  | following: 1   | 4                                     |
| CHEM 238 and Organic Chemistry Laboratory  CHEM 258 Organic Chemistry II - Reactivity and Applications  PHYS 207 Electricity and Magnetism for Engineering and Science and Electricity and Magnetism Laboratory for the Sciences  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-curriculum/)   Semester Credit Hours 13  Third Year  Fall  BICH 440 Biochemistry I 3  BICH 491 Research 1 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 302 or Principles of Genetics 3  or GENE 302 or Principles of Genetics 4  GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-curriculum/)   Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 2  or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 3  BICH 491 Research 1 1  STAT 302 Statistical Methods 3  or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core-  |  |  |                                       |
| Applications  PHYS 207 Electricity and Magnetism for Engineering & 4 8 PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 13  BICH 440 Biochemistry I 3  BICH 491 Research 1 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 303 Fundamentals of Genetics 3  or GENE 302 or Principles of Genetics GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1 2  or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 491 Research 1 1  STAT 302 Statistical Methods 3  or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-  | & CHEM 238   |  |                                       |
| & PHYS 227 and Science and Electricity and Magnetism Laboratory for the Sciences  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-corecurriculum/) 2  Semester Credit Hours 13  Third Year Fall  BICH 440 Biochemistry I 1 3  BICH 491 Research 1 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 303 Fundamentals of Genetics 3  or GENE 302 or Principles of Genetics 4  GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-corecurriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1 2  or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 491 Research 1 1  STAT 302 Statistical Methods 3  or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core-  | CHEM 258   |  |                                       |
| and Electricity and Magnetism Laboratory for the Sciences  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 13  Third Year  Fall  BICH 440 Biochemistry I 1 3  BICH 404 Biochemical Calculations 1 2  BICH 491 Research 1 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 303 Fundamentals of Genetics 3  or GENE 302 or Principles of Genetics  GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1 2  or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 491 Research 1 1  STAT 302 Statistical Methods 3  or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core-   |  | Electricity and Magnetism for Engineering  | 4                                     |
| University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours  Third Year Fall  BICH 440 Biochemistry I 1 3 BICH 404 Biochemical Calculations 1 2 BICH 491 Research 1 1 CHEM 321 Physical Chemistry for Life Sciences 3 GENE 303 Fundamentals of Genetics 3 or GENE 302 or Principles of Genetics 4 GENE 314 Principles of Genetics Laboratory 1 University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3 BICH 491 Research 1 1 STAT 302 Statistical Methods 3 or STAT 312 or Statistics for Biology University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-   | & PHYS 227   |  |                                       |
| undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 13  Third Year  Fall  BICH 440 Biochemistry I 1 3  BICH 404 Biochemical Calculations 1 2  BICH 491 Research 1 1  CHEM 321 Physical Chemistry for Life Sciences 3  GENE 303 Fundamentals of Genetics 3  or GENE 302 or Principles of Genetics 4  GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1 2  or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 491 Research 1 1  STAT 302 Statistical Methods or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core-  |  | for the Sciences   |                                       |
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| BICH 404 Biochemical Calculations 1 2 BICH 491 Research 1 1 CHEM 321 Physical Chemistry for Life Sciences 3 GENE 303 Fundamentals of Genetics 3 or GENE 302 or Principles of Genetics GENE 314 Principles of Genetics Laboratory 1 University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16 Spring BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432 BICH 441 Biochemistry II 1 3 BICH 491 Research 1 1 STAT 302 Statistical Methods or STAT 312 or Statistics for Biology University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-   | curriculum/) <sup>2</sup> Third Year   |  | 13                                    |
| CHEM 321 Physical Chemistry for Life Sciences 3 GENE 303 Fundamentals of Genetics 3 or GENE 302 or Principles of Genetics GENE 314 Principles of Genetics Laboratory 1 University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16 Spring  BICH 414 Biochemical Techniques I 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3 BICH 491 Research 1 1 STAT 302 Statistical Methods 3 or STAT 312 or Statistics for Biology University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-   | curriculum/) <sup>2</sup> Third Year Fall  | Semester Credit Hours  |                                       |
| CHEM 321 Physical Chemistry for Life Sciences  GENE 303 Fundamentals of Genetics or GENE 302 or Principles of Genetics  GENE 314 Principles of Genetics Laboratory 1 University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 491 Research 1 1  STAT 302 Statistical Methods or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-   | curriculum/) <sup>2</sup> Third Year Fall BICH 440   | Semester Credit Hours  Biochemistry I 1  | 3                                     |
| or GENE 302 or Principles of Genetics  GENE 314 Principles of Genetics Laboratory 1  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1 2  or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 491 Research 1 1  STAT 302 Statistical Methods 3  or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3  undergraduate/general-information/university-core-   | Third Year Fall BICH 440 BICH 404  | Semester Credit Hours  Biochemistry I  Biochemical Calculations   1  | 3 2                                   |
| GENE 314 Principles of Genetics Laboratory 1 University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16 Spring BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432 BICH 441 Biochemistry II 1 3 BICH 491 Research 1 1 STAT 302 Statistical Methods 3 or STAT 312 or Statistics for Biology University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-   | Third Year Fall BICH 440 BICH 404 BICH 491   | Semester Credit Hours  Biochemistry I  Biochemical Calculations  Research  Research  Research  | 3<br>2<br>1                           |
| University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 3  BICH 491 Research 1 1  STAT 302 Statistical Methods or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ undergraduate/general-information/university-core-  | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321  | Biochemistry I <sup>1</sup> Biochemical Calculations <sup>1</sup> Research <sup>1</sup> Physical Chemistry for Life Sciences   | 3<br>2<br>1<br>3                      |
| undergraduate/general-information/university-core- curriculum/) 2  Semester Credit Hours 16  Spring  BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 491 Research 1 1  STAT 302 Statistical Methods 3 or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-  | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321 GENE 303   | Semester Credit Hours  Biochemistry I  Biochemical Calculations  Research  Physical Chemistry for Life Sciences Fundamentals of Genetics   | 3<br>2<br>1<br>3                      |
| Semester Credit Hours  Spring  BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 441 Research 1 1  STAT 302 Statistical Methods or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-  | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321 GENE 303 or GENE 302   | Biochemistry I <sup>1</sup> Biochemical Calculations <sup>1</sup> Research <sup>1</sup> Physical Chemistry for Life Sciences Fundamentals of Genetics or Principles of Genetics  | 3<br>2<br>1<br>3<br>3                 |
| Spring  BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 491 Research 1 1  STAT 302 Statistical Methods 3 or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-   | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321 GENE 303 or GENE 302 GENE 314 University Core Cundergraduate/g   | Biochemistry I 1 Biochemical Calculations 1 Research 1 Physical Chemistry for Life Sciences Fundamentals of Genetics or Principles of Genetics Laboratory curriculum (https://catalog.tamu.edu/  | 3<br>2<br>1<br>3<br>3                 |
| BICH 414 Biochemical Techniques I 1 2 or BICH 432/ or Laboratory in Molecular Genetics GENE 432  BICH 441 Biochemistry II 1 3  BICH 491 Research 1 1  STAT 302 Statistical Methods 3 or STAT 312 or Statistics for Biology  University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-   | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321 GENE 303 or GENE 302 GENE 314 University Core Cundergraduate/g   | Biochemistry I 1 Biochemical Calculations 1 Research 1 Physical Chemistry for Life Sciences Fundamentals of Genetics or Principles of Genetics Principles of Genetics Laboratory Furriculum (https://catalog.tamu.edu/eneral-information/university-core-  | 3<br>2<br>1<br>3<br>3<br>1<br>3       |
| BICH 441 Biochemistry II 1 3 BICH 491 Research 1 1 STAT 302 Statistical Methods 3 or STAT 312 or Statistics for Biology University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-   | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321 GENE 303 or GENE 302 GENE 314 University Core Cundergraduate/g curriculum/) 2  | Biochemistry I 1 Biochemical Calculations 1 Research 1 Physical Chemistry for Life Sciences Fundamentals of Genetics or Principles of Genetics Principles of Genetics Laboratory Furriculum (https://catalog.tamu.edu/eneral-information/university-core-  | 3<br>2<br>1<br>3<br>3<br>1<br>3       |
| BICH 491 Research 1 1 STAT 302 Statistical Methods 3 or STAT 312 or Statistics for Biology University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-  | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321 GENE 303 or GENE 302 GENE 314 University Core Cundergraduate/g curriculum/) Spring BICH 414 or BICH 432/   | Biochemistry I 1 Biochemical Calculations 1 Research 1 Physical Chemistry for Life Sciences Fundamentals of Genetics or Principles of Genetics Principles of Genetics Laboratory curriculum (https://catalog.tamu.edu/eneral-information/university-core-  | 3<br>2<br>1<br>3<br>3<br>1<br>3       |
| STAT 302 Statistical Methods 3 or STAT 312 or Statistics for Biology University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-  | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321 GENE 303 or GENE 302 GENE 314 University Core Cundergraduate/g curriculum/) 2  Spring BICH 414 or BICH 432/ GENE 432   | Biochemistry I 1 Biochemical Calculations 1 Research 1 Physical Chemistry for Life Sciences Fundamentals of Genetics or Principles of Genetics Principles of Genetics Laboratory Furriculum (https://catalog.tamu.edu/eneral-information/university-core-  | 3<br>2<br>1<br>3<br>3<br>1<br>3       |
| or STAT 312 or Statistics for Biology University Core Curriculum (https://catalog.tamu.edu/ 3 undergraduate/general-information/university-core-   | curriculum/) <sup>2</sup> Third Year Fall  BICH 440  BICH 404  BICH 491  CHEM 321  GENE 303  or GENE 302  GENE 314  University Core Cundergraduate/g curriculum/) <sup>2</sup> Spring  BICH 414  or BICH 432/ GENE 432  BICH 441 | Biochemistry I 1 Biochemical Calculations 1 Research 1 Physical Chemistry for Life Sciences Fundamentals of Genetics or Principles of Genetics Principles of Genetics Laboratory curriculum (https://catalog.tamu.edu/eneral-information/university-core-  Semester Credit Hours  Biochemical Techniques I 1 or Laboratory in Molecular Genetics  Biochemistry II 1                                | 3<br>2<br>1<br>3<br>3<br>1<br>3<br>16 |
| undergraduate/general-information/university-core-   | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321 GENE 303 or GENE 302 GENE 314 University Core Cundergraduate/g curriculum/) Spring BICH 414 or BICH 432/ GENE 432 BICH 441 BICH 491  | Biochemistry I 1 Biochemical Calculations 1 Research 1 Physical Chemistry for Life Sciences Fundamentals of Genetics or Principles of Genetics Principles of Genetics Laboratory curriculum (https://catalog.tamu.edu/eneral-information/university-core-  Semester Credit Hours  Biochemical Techniques I 1 or Laboratory in Molecular Genetics  Biochemistry II 1 Research 1                     | 3<br>2<br>1<br>3<br>3<br>1<br>16<br>2 |
|  | Third Year Fall BICH 440 BICH 404 BICH 491 CHEM 321 GENE 303 or GENE 302 GENE 314 University Core Cundergraduate/g curriculum/) 2  Spring BICH 414 or BICH 432/ GENE 432 BICH 441 BICH 491 STAT 302                              | Biochemistry I 1 Biochemical Calculations 1 Research 1 Physical Chemistry for Life Sciences Fundamentals of Genetics or Principles of Genetics Principles of Genetics Laboratory curriculum (https://catalog.tamu.edu/eneral-information/university-core-  Semester Credit Hours  Biochemical Techniques I 1 or Laboratory in Molecular Genetics  Biochemistry II 1 Research 1 Statistical Methods | 3<br>2<br>1<br>3<br>3<br>1<br>16<br>2 |

| General elective <sup>3</sup>   |                                 | 3   |
|---|---------------------------------|-----|
|   | Semester Credit Hours           | 15  |
| Fourth Year   |                                 |     |
| Fall  |                                 |     |
| BICH 431/<br>GENE 431   | Molecular Genetics <sup>1</sup> | 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   |
|   | Semester Credit Hours           | 14  |
| Spring  |                                 |     |
| University Core Curriculum (https://catalog.tamu.edu/undergraduate/general-information/university-corecurriculum/) $^2$ |                                 | 6   |
| Biochemistry elective <sup>5</sup>  |                                 | 3   |
| General elective <sup>3</sup>   |                                 | 6   |
| Semester Credit Hours   |                                 | 15  |
|   | Total Semester Credit Hours     | 120 |

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

To be selected from the University Core Curriculum (https:// catalog.tamu.edu/undergraduate/general-information/universitycore-curriculum/). Of the 21 hours shown as University Core Curriculum (https://catalog.tamu.edu/undergraduate/generalinformation/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/culturaldiscourse-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.

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/math/).

The fourth registered hour of research must be taken as writing intensive.

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.