

# BS in Biochemistry

There are a wide range of career options for chemists and biochemists in a diverse array of occupational fields. Opportunities can be divided into five main sectors: Industry, Academia, Government, Non-Profit, and Entrepreneurship. In addition, the programs of study for both chemistry and biochemistry degrees provide strong academic, critical thinking, and foundational skills for students interested in pursuing advanced professional degrees in medicine, dentistry, veterinary medicine, and pharmacy, as well as rigorous preparation for graduate school.

The curriculum requirement to obtain a BS in Biochemistry consists of the general College of Science curriculum requirements.

## Marketable Skills

Students develop the following marketable skills:

- Communication: Reach mutual understanding through the effective exchange of information, ideas, and feelings
- Critical thinking: Analyze and evaluate issues in order to solve problems and develop informed opinions
- Organization: Use resources effectively and efficiently in order to stay focused on different tasks
- Problem-solving: Find solutions to difficult or complex issues
- Research: Be able to search, investigate and critically analyze information in response to a specific research question
- Time management: Prioritize goals and organize time to be more productive and efficient.

Additionally, students will be:

- Using laboratory equipment
- Maintaining precision and accuracy
- Organizing and reporting data, results and conclusions
- Explaining complex ideas for technical and non-technical audiences

## Degree Plan

Required Credits: 120

| Code  | Title   | Hours |
|---|---|-------|
| <b>Designated Core (All courses require a grade of C or better)</b> |   |       |
| Required Courses: <sup>1</sup>                                      |   |       |
| MATH 1411   | Calculus I  |       |
| PHYS 2320<br>& PHYS 2120  | Introductory Mechanics<br>and Laboratory for PHYS 2320        |       |
| PHYS 2321<br>& PHYS 2121  | Introductory Electromagnetism<br>and Laboratory for PHYS 2321 |       |
| <b>University Core Curriculum</b>                                   |   |       |
| Complete the University Core Curriculum requirements. (p. 2)        |   | 42    |
| <b>Biochemistry Major</b>   |   |       |
| Required Courses:   |   |       |
| CHEM 3330<br>& CHEM 3131  | Biochem I: Struc & Function<br>and Lab for Chemistry          | 4     |
| CHEM 3332   | Biochem II: Metabol & Bioenerg                                | 3     |
| CHEM 4334<br>& CHEM 4134  | Structural Biochemistry<br>and Structural Biochemistry Lab    | 4     |
| CHEM 4335   | Biophysical Chemistry   | 3     |
| <b>Required Chemistry Courses</b>                                   |   |       |
| CHEM 1305<br>& CHEM 1105  | General Chemistry<br>and Laboratory for CHEM 1305             | 4     |
| CHEM 1306<br>& CHEM 1106  | General Chemistry<br>and Laboratory for CHEM 1306             | 4     |
| CHEM 2321<br>& CHEM 2221  | Organic Chemistry I<br>and Organic Chemistry I Lab            | 5     |
| CHEM 2322<br>& CHEM 2222  | Organic Chemistry II<br>and Organic Chemistry II Lab          | 5     |

|  |  |            |
|--|--|------------|
| CHEM 3310<br>& CHEM 3110   | Analytical Chemistry<br>and Lab for Chemistry 3310               | 4          |
| <b>Other Required Courses</b>  |  |            |
| BIOL 1305<br>& BIOL 1107   | General Biology<br>and Topics in Study of Life I                 | 4          |
| BIOL 1306<br>& BIOL 1108   | Organismal Biology<br>and Organismal Biology Laboratory          | 4          |
| BIOL 3314<br>& BIOL 3115   | Molecular Cell Biology<br>and Molecular Cell Biol Laboratory     | 4          |
| BIOL 3320  | Genetics   | 3          |
| MATH 1312  | Calculus II  | 3          |
| MICR 2340<br>& MICR 2141   | General Microbiology<br>and Gen Microbiology Laboratory          | 4          |
| MICR 3349<br>& MICR 3150   | Prokaryotic Molecular Genetic<br>and Prokaryotic Mol Genetic Lab | 4          |
| STAT 2480  | Elementary Statistical Methods                                   | 4          |
| <b>Prescribed Elective Courses</b>   |  |            |
| Select Nine Hours:   |  | 9          |
| BIOL 4388  | Mammalian Physiology   |            |
| CHEM 3151<br>& CHEM 3351   | Lab for Chemistry 3351<br>and Physical Chemistry I               |            |
| CHEM 3152<br>& CHEM 3352   | Lab for Chemistry 3352<br>and Physical Chemistry II              |            |
| CHEM 4176  | Introduction to Research   |            |
| CHEM 4211<br>& CHEM 4212   | Instrumental Meths Analyt Chem<br>and Lab for Chemistry 4211     |            |
| CHEM 4328  | Advanced Topics Organic Chem                                     |            |
| CHEM 4362  | Structure of Matter  |            |
| CHEM 4365  | Inorganic Chemistry  |            |
| CHEM 4376  | Introduction to Research   |            |
| MICR 3144<br>& MICR 3343   | Pathogenic Microbiology Lab<br>and Pathogenic Microbiology       |            |
| MICR 3146<br>& MICR 3345   | Microbial Physiology Lab<br>and Microbial Physiology             |            |
| MICR 4329  | Epidemiology   |            |
| MICR 4351  | General Virology   |            |
| MICR 4355  | Medical Mycology   |            |
| ZOOL 4181  | Vertebrate Physiology Methods                                    |            |
| ZOOL 4384  | Cellular Neuroscience  |            |
| <b>Total Hours</b>   |  | <b>120</b> |
| 1 Although the UTEP choice is larger, these choices satisfy the requirements of both the core and the major. |  |            |
| 2 A total of thirty-seven hours of upper division coursework is required of all Bachelor of Science degrees. |  |            |
| C Course requires a grade of C or better.  |  |            |

## University Core Curriculum (A program may recommend specific courses. All courses require a C or better.)

### I. Communication (six hours)

| Code   | Title | Hours |
|--|-------|-------|
| Courses in this category focus on developing ideas and expressing them clearly, considering the effect of the message, fostering understanding, and building the skills needed to communicate persuasively. Courses involve the command of oral, aural, written, and visual literacy skills that enable people to exchange messages appropriate to the subject, occasion, and audience. Course objectives for this component are: Critical Thinking Skills, Communication Skills, Teamwork, and Personal Responsibility. |       |       |
| Select six hours of the following:   |       | 6     |

For students whose secondary education was in English:

|           |                                |
|-----------|--------------------------------|
| COMM 1611 | Written and Oral Communication |
| ENGL 1313 | Writing About Literature       |
| RWS 1301  | Rhetoric & Composition I       |
| RWS 1302  | Rhetoric & Composition 2       |
| RWS 1601  | Rhetoric, Composition & Comm   |

For students whose secondary education was not in English:

|           |                            |
|-----------|----------------------------|
| ESOL 1311 | Expos Engl Compos-Spkr Esl |
| ESOL 1312 | Res & Crit Writng Spkr Esl |

|                    |          |
|--------------------|----------|
| <b>TOTAL HOURS</b> | <b>6</b> |
|--------------------|----------|

## II. American History (six hours)

| Code | Title | Hours |
|------|-------|-------|
|------|-------|-------|

Courses in this category focus on the consideration of past events and ideas relative to the United States, with the option of including Texas History for a portion of this component area. Courses involve the interaction among individuals, communities, states, the nation, and the world, considering how these interactions have contributed to the development of the United States and its global role. Course objectives for this component are: Critical Thinking Skills, Communication Skills, Social Responsibility, and Personal Responsibility.

|           |                            |   |
|-----------|----------------------------|---|
| HIST 1301 | History of U.S. to 1865    | 3 |
| HIST 1302 | History of U.S. Since 1865 | 3 |

|                    |          |
|--------------------|----------|
| <b>TOTAL HOURS</b> | <b>6</b> |
|--------------------|----------|

## III. Language, Philosophy & Culture (three hours)

| Code | Title | Hours |
|------|-------|-------|
|------|-------|-------|

Courses in this category focus on how ideas, values, beliefs, and other aspects of culture express and affect human experience. Courses involve the exploration of ideas that foster aesthetic and intellectual creation in order to understand the human condition across cultures. Course objectives for this component are: Critical Thinking Skills, Communication Skills, Social Responsibility, and Personal Responsibility.

|                              |   |
|------------------------------|---|
| Select one of the following: | 3 |
|------------------------------|---|

|           |                                |
|-----------|--------------------------------|
| ANTH 2325 | Language in Culture & Society  |
| AFST 2300 | Intro-African Amer Studies     |
| CHIC 2302 | Latina/o Presence in the U.S.  |
| ENGL 2311 | English Literature             |
| ENGL 2312 | English Literature             |
| ENGL 2313 | Intro to American Fiction      |
| ENGL 2314 | Intro to American Drama        |
| ENGL 2318 | Intro to American Poetry       |
| ENGL 2325 | Language in Culture & Society  |
| FREN 2322 | Making of the "Other" Americas |
| HIST 2301 | World History to 1500          |
| HIST 2302 | World History Since 1500       |
| LING 2325 | Language in Culture & Society  |
| PHIL 1301 | Introduction to Philosophy     |
| PHIL 2306 | Ethics                         |
| RS 1301   | Introduct to Religious Studies |
| SPAN 2340 | Seeing & Naming: Conversations |
| WS 2300   | Introduction to Womens Studies |
| WS 2350   | Global Feminisms               |

|                    |          |
|--------------------|----------|
| <b>TOTAL HOURS</b> | <b>3</b> |
|--------------------|----------|

## IV. Mathematics (three hours)

| Code | Title | Hours |
|------|-------|-------|
|------|-------|-------|

Courses in this category focus on quantitative literacy in logic, patterns, and relationships. Courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experience. Course objectives for this component are: Critical Thinking Skills, Communication Skills, and Empirical & Quantitative Skills.

|                              |   |
|------------------------------|---|
| Select one of the following: | 3 |
|------------------------------|---|

|             |                                |   |
|-------------|--------------------------------|---|
| MATH 1309   | College Algebra                |   |
| MATH 1310   | Trigonometry and Conics        |   |
| MATH 1319   | Math in the Modern World       |   |
| MATH 1320   | Math for Social Sciences I     |   |
| MATH 1411   | Calculus I                     |   |
| MATH 1508   | Precalculus                    |   |
| MATH 2301   | Math for Social Sciences II    |   |
| STAT 1380   | Statistical Literacy           |   |
| STAT 2480   | Elementary Statistical Methods |   |
| TOTAL HOURS |                                | 3 |

## V. Life & Physical Sciences (six hours)

| Code | Title | Hours |
|------|-------|-------|
|------|-------|-------|

Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on experiences. Course objectives for this component are: Critical Thinking Skills, Communication Skills, Empirical & Quantitative Skills, and Teamwork.

Required: Lecture/Lab Sequence plus Additional Lecture

|           |                               |
|-----------|-------------------------------|
| ASTR 1107 | Astronomy Lab I               |
| ASTR 1307 | Elem Astronomy-Solar System   |
| ASTR 1308 | Elem Astr Stars & Galaxies    |
| BIOL 1103 | Introductory Biology Lab      |
| BIOL 1104 | Human Biology Laboratory      |
| BIOL 1107 | Topics in Study of Life I     |
| BIOL 1108 | Organismal Biology Laboratory |
| BIOL 1203 | Introductory Biology          |
| BIOL 1304 | Human Biology                 |
| BIOL 1305 | General Biology               |
| BIOL 1306 | Organismal Biology            |
| BIOL 2111 | Human Anat/Physio Lab I       |
| BIOL 2113 | Human Anat/Physio Lab II      |
| BIOL 2311 | Human Anat/Physiology I       |
| BIOL 2313 | Human Anat/Physiology II      |
| CHEM 1105 | Laboratory for CHEM 1305      |
| CHEM 1106 | Laboratory for CHEM 1306      |
| CHEM 1107 | Intro General Chemistry Lab   |
| CHEM 1108 | Intro Organic & Biochem Lab   |
| CHEM 1305 | General Chemistry             |
| CHEM 1306 | General Chemistry             |
| CHEM 1307 | Intro to General Chemistry    |
| CHEM 1308 | Intro Organic & Biochemistry  |
| ESCI 1101 | Environmental Sci. Lab        |
| ESCI 1102 | Non-major Lab for ESCI 1301   |
| ESCI 1301 | Intro to Environmental Sci    |
| GEOG 1106 | Laboratory for GEOG 1306      |
| GEOG 1306 | Physical Geography            |
| GEOL 1103 | Lab for GEOL 1313             |
| GEOL 1104 | Lab for GEOL 1314             |
| GEOL 1111 | Principles of Earth Sci - Lab |
| GEOL 1112 | Laboratory for Geology 1212   |
| GEOL 1211 | Principles of Earth Sciences  |
| GEOL 1212 | Principles of Earth Science   |
| GEOL 1230 | The Blue Planet               |
| GEOL 1231 | Natural Hazards               |

|             |                               |   |
|-------------|-------------------------------|---|
| GEOL 1313   | Intro to Physical Geology     |   |
| GEOL 1314   | Intro to Historical Geol      |   |
| HSCI 2302   | Fundamentals of Nutrition     |   |
| HSCI 2303   | Wellness Dynamics             |   |
| MICR 2330   | Microorganisms and Disease    |   |
| PHYS 1403   | General Physics I             |   |
| PHYS 1404   | General Physics II            |   |
| PHYS 2120   | Laboratory for PHYS 2320      |   |
| PHYS 2121   | Laboratory for PHYS 2321      |   |
| PHYS 2320   | Introductory Mechanics        |   |
| PHYS 2321   | Introductory Electromagnetism |   |
| TOTAL HOURS |                               | 6 |

## VI. Political Science (six hours)

| Code   | Title                     | Hours    |
|--|---------------------------|----------|
| Courses in this category focus on consideration of the Constitution of the United States and the constitutions of the states, with special emphasis on that of Texas. Courses involve the analysis of governmental institutions, political behavior, civic engagement, and their political and philosophical foundations. Course objectives for this component are: Critical Thinking Skills, Communication Skills, Social Responsibility and Personal Responsibility. |                           |          |
| Required Courses:  |                           |          |
| POLS 2310  | Introduction to Politics  | 3        |
| POLS 2311  | American Gover & Politics | 3        |
| <b>TOTAL HOURS</b>   |                           | <b>6</b> |

## VII. Social & Behavioral Sciences (three hours)

| Code   | Title                          | Hours    |
|--|--------------------------------|----------|
| Courses in this category focus on the application of empirical and scientific methods that contribute to the understanding of what makes us human. Courses involve the exploration of behavior and interactions among individuals, groups, institutions, and events, examining their impact on the individual, society, and culture. Course objectives for this component are: Critical Thinking Skills, Communication Skills, Empirical & Quantitative Skills, and Social Responsibility. |                                |          |
| Select one of the following:   |                                | 3        |
| ANTH 1301  | Origins of Humanity            |          |
| ANTH 1302  | World Cultures                 |          |
| ANTH 1310  | Cultural Geography             |          |
| ANTH 2320  | Introduction to Human Language |          |
| ASIA 2300  | Asian American Studies         |          |
| CE 2326  | Econ for Engrs & Scientists    |          |
| CHIC 2311  | Intro to Chicano Studies       |          |
| COMM 2350  | Interpersonal Communication    |          |
| COMM 2372  | Mass Media and Society         |          |
| ECON 2303  | Principles of Macroeconomics   |          |
| ECON 2304  | Principles of Microeconomics   |          |
| EDPC 1301  | Introduction to Ed Psychology  |          |
| EDU 1342   | Action Research in Classrooms  |          |
| ENGL 2320  | Introduction to Human Language |          |
| GEOG 1310  | Cultural Geography             |          |
| LEAD 2300  | Leadership in Action           |          |
| LING 2320  | Introduction to Human Language |          |
| LING 2340  | Lang. Inside & Out: Sel Topics |          |
| PSYC 1301  | Introduction to Psychology     |          |
| SOCI 1301  | American Society               |          |
| SOCI 1310  | Cultural Geography             |          |
| <b>TOTAL HOURS</b>   |                                | <b>3</b> |

## VIII. Creative Arts

| Code   | Title                         | Hours    |
|--|-------------------------------|----------|
| Courses in this category focus on the appreciation and analysis of creative artifacts and works of the human imagination. Courses involve the synthesis and interpretation of artistic expression and enable critical, creative, and innovative communication about works of art. Course objectives for this component are: Critical Thinking Skills, Communication Skills, Teamwork, and Social Responsibility. |                               |          |
| Select one of the following:   |                               | 3        |
| ART 1300   | Art Appreciation              |          |
| ARTH 1305  | History of Art I              |          |
| ARTH 1306  | History of Art II             |          |
| CHIC 1311  | Chicana/o Fine Arts Appreciat |          |
| DANC 1304  | Introduction to Dance         |          |
| FILM 1390  | Intro-Art of Motion Pict.     |          |
| MUSL 1324  | Music Appreciation            |          |
| MUSL 1327  | Jazz to Rock                  |          |
| MUSL 2321  | Music, Culture, and Society   |          |
| THEA 1313  | Introduction to Theatre       |          |
| <b>TOTAL HOURS</b>   |                               | <b>3</b> |

## IX. Component Area Option (six hours)

| Code   | Title                          | Hours    |
|--|--------------------------------|----------|
| a. A minimum of 3 SCH must meet the definition and corresponding Core Objectives specified in one of the foundational component areas. b. As an option for up to 3 semester credit hours of the Component Area Option, an institution may select course(s) that: (i) Meet(s) the definition specified for one or more of the foundational component areas; and (ii) Include(s) a minimum of three Core Objectives, including Critical Thinking Skills, Communication Skills, and one of the remaining Core Objectives of the institution's choice. |                                |          |
| ANTH 1312 Science & Society  |                                |          |
| ANTH 1313 Human Variation  |                                |          |
| BUSN 1301  | Intro to Global Business       |          |
| COMM 1301  | Public Speaking                |          |
| COMM 1302  | Business/Profession Comm       |          |
| CS 1310  | Intro-Computational Thinking   |          |
| CS 1320  | Computer Programming Sci/Engr  |          |
| EL 1301  | Eng Innovation and Leadership  |          |
| ENGR 1302  | Engineering Design Experience  |          |
| ENGR 1303  | Applied Engineering Analysis   |          |
| KIN 1301 Physical Activity for Health & Wellness   |                                |          |
| LEAD 1300  | Introduction to Leadership     |          |
| SCI 1301   | Inquiry in Math & Science      |          |
| SOCI 1312 Science & Society  |                                |          |
| SPLP 1312  | Comm. Var. Across the Lifespan |          |
| UNIV 1301  | Seminar/Critical Inquiry       |          |
| <b>TOTAL HOURS</b>   |                                | <b>6</b> |

## 4-Year Sample Degree Plan

### BS Biochemistry- Starting with Calculus

| Code                     | Title   | Hours |
|--------------------------|---|-------|
| <b>BS BIOCHEMISTRY</b>   |   |       |
| <b>FRESHMAN</b>          |   |       |
| <b>Fall</b>              |   |       |
| BIOL 1305<br>& BIOL 1107 | General Biology<br>and Topics in Study of Life I  | 4     |
| CHEM 1305<br>& CHEM 1105 | General Chemistry<br>and Laboratory for CHEM 1305 | 4     |
| MATH 1411                | Calculus I  | 4     |

|                          |  |   |
|--------------------------|--|---|
| SCI 1301                 | Inquiry in Math & Science  | 3 |
| <b>Spring</b>            |  |   |
| BIOL 1306<br>& BIOL 1108 | Organismal Biology<br>and Organismal Biology Laboratory          | 4 |
| CHEM 1306<br>& CHEM 1106 | General Chemistry<br>and Laboratory for CHEM 1306                | 4 |
| COMM 1301                | Public Speaking  | 3 |
| MATH 1312                | Calculus II  | 3 |
| RWS 1301                 | Rhetoric & Composition I   | 3 |
| <b>SOPHOMORE</b>         |  |   |
| <b>Fall</b>              |  |   |
| CHEM 2321<br>& CHEM 2221 | Organic Chemistry I<br>and Organic Chemistry I Lab               | 5 |
| HIST 1301                | History of U.S. to 1865  | 3 |
| PHYS 2320<br>& PHYS 2120 | Introductory Mechanics<br>and Laboratory for PHYS 2320           | 4 |
| STAT 2480                | Elementary Statistical Methods                                   | 4 |
| <b>Spring</b>            |  |   |
| CHEM 2322<br>& CHEM 2222 | Organic Chemistry II<br>and Organic Chemistry II Lab             | 5 |
| HIST 1302                | History of U.S. Since 1865                                       | 3 |
| PHYS 2321<br>& PHYS 2121 | Introductory Electromagnetism<br>and Laboratory for PHYS 2321    | 4 |
| RWS 1302                 | Rhetoric & Composition 2   | 3 |
| <b>JUNIOR</b>            |  |   |
| <b>Fall</b>              |  |   |
| CHEM 3310<br>& CHEM 3110 | Analytical Chemistry<br>and Lab for Chemistry 3310               | 4 |
| CHEM 3330<br>& CHEM 3131 | Biochem I: Struc & Function<br>and Lab for Chemistry             | 4 |
| PHIL 2306                | Ethics   | 3 |
| POLS 2310                | Introduction to Politics   | 3 |
| PSYC 1301                | Introduction to Psychology                                       | 3 |
| <b>Spring</b>            |  |   |
| ART 1300                 | Art Appreciation   | 3 |
| CHEM 3332                | Biochem II: Metabol & Bioenerg                                   | 3 |
| MICR 2340<br>& MICR 2141 | General Microbiology<br>and Gen Microbiology Laboratory          | 4 |
| POLS 2311                | American Gover & Politics  | 3 |
| <b>SENIOR</b>            |  |   |
| <b>Fall</b>              |  |   |
| BIOL 3314<br>& BIOL 3115 | Molecular Cell Biology<br>and Molecular Cell Biol Laboratory     | 4 |
| CHEM 4334<br>& CHEM 4134 | Structural Biochemistry<br>and Structural Biochemistry Lab       | 4 |
| Upper Division Elective  |  | 3 |
| Upper Division Elective  |  | 3 |
| <b>Spring</b>            |  |   |
| MICR 3349<br>& MICR 3150 | Prokaryotic Molecular Genetic<br>and Prokaryotic Mol Genetic Lab | 4 |
| BIOL 3320                | Genetics   | 3 |
| CHEM 4335                | Biophysical Chemistry  | 3 |

Upper Division Elective

3

**Total Hours****120****BS Biochemistry- Starting with Pre-Calculus**

| Code                     | Title   | Hours |
|--------------------------|---|-------|
| <b>BS BIOCHEMISTRY</b>   |   |       |
| <b>FRESHMAN</b>          |   |       |
| <b>Fall</b>              |   |       |
| BIOL 1305<br>& BIOL 1107 | General Biology<br>and Topics in Study of Life I              | 4     |
| CHEM 1305<br>& CHEM 1105 | General Chemistry<br>and Laboratory for CHEM 1305             | 4     |
| MATH 1508                | Precalculus   | 5     |
| SCI 1301                 | Inquiry in Math & Science                                     | 3     |
| <b>Spring</b>            |   |       |
| BIOL 1306<br>& BIOL 1108 | Organismal Biology<br>and Organismal Biology Laboratory       | 4     |
| CHEM 1306<br>& CHEM 1106 | General Chemistry<br>and Laboratory for CHEM 1306             | 4     |
| COMM 1301                | Public Speaking   | 3     |
| MATH 1411                | Calculus I  | 4     |
| RWS 1301                 | Rhetoric & Composition I                                      | 3     |
| <b>SOPHOMORE</b>         |   |       |
| <b>Fall</b>              |   |       |
| CHEM 2321<br>& CHEM 2221 | Organic Chemistry I<br>and Organic Chemistry I Lab            | 5     |
| HIST 1301                | History of U.S. to 1865                                       | 3     |
| MATH 1312                | Calculus II   | 3     |
| PHYS 2320<br>& PHYS 2121 | Introductory Mechanics<br>and Laboratory for PHYS 2321        | 4     |
| <b>Spring</b>            |   |       |
| CHEM 2322<br>& CHEM 2222 | Organic Chemistry II<br>and Organic Chemistry II Lab          | 5     |
| HIST 1302                | History of U.S. Since 1865                                    | 3     |
| PHYS 2321<br>& PHYS 2121 | Introductory Electromagnetism<br>and Laboratory for PHYS 2321 | 4     |
| RWS 1302                 | Rhetoric & Composition 2                                      | 3     |
| STAT 2480                | Elementary Statistical Methods                                | 4     |
| <b>JUNIOR</b>            |   |       |
| <b>Fall</b>              |   |       |
| CHEM 3310<br>& CHEM 3110 | Analytical Chemistry<br>and Lab for Chemistry 3310            | 4     |
| CHEM 3330<br>& CHEM 3131 | Biochem I: Struc & Function<br>and Lab for Chemistry          | 4     |
| PHIL 2306                | Ethics  | 3     |
| PSYC 1301                | Introduction to Psychology                                    | 3     |
| POLS 2310                | Introduction to Politics                                      | 3     |
| <b>Spring</b>            |   |       |
| ART 1300                 | Art Appreciation  | 3     |
| CHEM 3332                | Biochem II: Metabol & Bioenerg                                | 3     |
| MICR 2340<br>& MICR 2141 | General Microbiology<br>and Gen Microbiology Laboratory       | 4     |
| POLS 2311                | American Gover & Politics                                     | 3     |
| <b>SENIOR</b>            |   |       |



**Fall**

|                          |  |   |
|--------------------------|--|---|
| BIOL 3314<br>& BIOL 3115 | Molecular Cell Biology<br>and Molecular Cell Biol Laboratory | 4 |
| CHEM 4334<br>& CHEM 4134 | Structural Biochemistry<br>and Structural Biochemistry Lab   | 4 |
| Upper Division Elective  |  | 3 |
| Upper Division Elective  |  | 3 |

**Spring**

|                          |  |   |
|--------------------------|--|---|
| BIOL 3320                | Genetics   | 3 |
| CHEM 4335                | Biophysical Chemistry  | 3 |
| MICR 3349<br>& MICR 3150 | Prokaryotic Molecular Genetic<br>and Prokaryotic Mol Genetic Lab | 4 |
| Upper Division Elective  |  | 3 |

|                    |  |            |
|--------------------|--|------------|
| <b>Total Hours</b> |  | <b>125</b> |
|--------------------|--|------------|