

# BIOLOGY, BS

Biology offers courses in the life sciences designed to teach students biological concepts and principles with emphasis on individual laboratory experiences. The curriculum provides a sound basis for professional training in biology, biotechnology, medicine, dentistry, veterinary medicine, allied health, and teaching, as well as for general science education. Biology and Allied Health majors with strong academic backgrounds are encouraged to apply to the Roosevelt Scholars Program, the honors curriculum of the university.

See the Allied Health program listing for degree programs leading to clinical licensing for fields such as Medical Technology, Nuclear Medicine Technology and Radiation Therapy Technology.

The BS in Biology prepares students for jobs in the biotechnology industry, including pharmaceutical companies, university research laboratories, medical research centers, forensic laboratories, museums and government agencies such as the EPA, OSHA, FDA, IDNR, and the Department of Agriculture. It also prepares students to teach biology at the secondary level and for admission to graduate health professional programs such as medical, dental, veterinary and optometry schools, physician assistant, physical therapy, and nurse practitioner training, and graduate programs in the life sciences. All students considering the BS in Biology should consult an advisor in the Department of Biological, Chemical, and Physical Sciences.

Students who plan to teach biology in secondary school may qualify for Roosevelt University's recommendation to the Illinois State Board of Education for teacher certification. This program provides biology majors with the flexibility to teach mathematics and general science as well as biology in grades 6-12. Application for admission to the program must be made to the College of Education before the student begins the senior year (less than 90 credit hours completed). Requirements are listed under secondary teacher education. Students interested in this option should see an advisor in the College of Education for specific course selections.

## Standards

Courses taken for the major or minor must be taken on a letter grade basis.

## Requirements

- Students must complete the final 30 credit hours of their degree at Roosevelt University.
- A total of 35 credit hours of acceptable biology courses is required for the B.S.
- At least 20 credit hours in acceptable biology, chemistry, and physics courses must be taken at Roosevelt University; not more than 15 credit hours of acceptable biology courses may be completed elsewhere and applied to the BS biology degree.
- Following enrollment, completion of all remaining biology, chemistry, physics and mathematics course requirements for Biology degrees must be accomplished at Roosevelt University. Under special circumstances, written permission to take required courses elsewhere may be granted by biology advisors.
- Courses in biology must have been taken within the past eight years to be accepted for prerequisites and graduation.
- No more than credit hours total of independent study (BIOL 395 INDEPENDENT STUDY), (BIOL 392 RESEARCH IN BIOLOGY), and internships (BIOL 391 MEDICAL INTERNSHIP, BIOL 393 VETERINARY

INTERNSHIP or BIOL 396 BIOLOGY INTERNSHIP) in biology may be used to fulfill the requirements of the major.

- Technical and/or clinical courses are not acceptable for transfer credit.
- AP biology credit with a score of 3.0 or higher may apply toward the major in biology or the general education requirements after consultation with an advisor.
- AP chemistry with a score of 4 or 5 satisfies the requirements for CHEM 201 with lab.
- For AP physics credit, consult an advisor.
- At least one biology course with a laboratory above BIOL 301 CELLULAR & MOLECULAR BIOLOGY (not including independent research) must be passed with a grade of C- or better.
- A grade of C- is the minimal acceptable grade for a course to be applied to the major and the supporting sequence, or to be acceptable as a prerequisite for subsequent courses.
- A minimum cumulative GPA of 2.0 is required for all course in the major.

### Courses Required for the Biology BS

|          |   |   |
|----------|---|---|
| BIOL 201 | ORGANISMIC BIOLOGY (with lab)                           | 5 |
| BIOL 202 | ECOLOGY, EVOLUTION, AND GENETICS (with lab)             | 5 |
| BIOL 301 | CELLULAR & MOLECULAR BIOLOGY (with lab)                 | 5 |
| CHEM 201 | GENERAL CHEMISTRY I (with lab)                          | 5 |
| CHEM 202 | GENERAL CHEMISTRY II (with lab)                         | 5 |
| CHEM 211 | ORGANIC CHEMISTRY I (with lab)                          | 5 |
| CHEM 212 | ORGANIC CHEMISTRY II (with lab)                         | 5 |
| MATH 121 | COLLEGE ALGEBRA   | 3 |
| MATH 122 | TRIGONOMETRY AND PRECALCULUS                            | 3 |
| MATH 217 | ELEMENTARY STATISTICS                                   | 3 |
| MATH 231 | CALCULUS I  | 5 |
| MATH 232 | CALCULUS II   | 5 |
| PHYS 201 | INTRODUCTION TO NON-CALCULUS BASED PHYSICS I (with lab) | 4 |
| PHYS 202 | INTRO TO NON-CALCULUS PHYSICS II (with lab)             | 4 |
| PHYS 233 | CALCULUS-BASED PHYSICS I DISCUSSION                     | 1 |
| PHYS 234 | CALCULUS-BASED PHYSICS II DISCUSSION                    | 1 |

### Electives

Select additional biology electives to bring total to a minimum of 35 credit hours:<sup>1</sup>

|          |  |  |
|----------|--|--|
| BCHM 354 | EXPERIMENTAL METHODS IN BIOCHEMISTRY & BIOTECHNOLOGY |  |
| BCHM 355 | BIOCHEMISTRY   |  |
| BCHM 357 | ADVANCED BIOCHEMISTRY                                |  |
| BIOL 123 | ANATOMY & PHYSIOLOGY I                               |  |
| BIOL 124 | ANATOMY & PHYSIOLOGY II                              |  |
| BIOL 221 | KINESIOLOGY  |  |
| BIOL 242 | ANIMAL BEHAVIOR                                      |  |
| BIOL 302 | DIVERSITY AND EVOLUTION                              |  |
| BIOL 310 | FUNDAMENTALS OF BEHAVIOR NEUROSCIENCE                |  |

|          |                                       |
|----------|---------------------------------------|
| BIOL 314 | QUANTITATIVE ECOLOGY AND CONSERVATION |
| BIOL 315 | ECOLOGY                               |
| BIOL 322 | BOTANY                                |
| BIOL 323 | TROPICAL MARINE BIOLOGY               |
| BIOL 324 | MARINE BIOLOGY                        |
| BIOL 332 | ECOLOGY OF TALLGRASS PRAIRIE          |
| BIOL 339 | EVOLUTIONARY PHYSIOLOGY               |
| BIOL 340 | APPLICATIONS IN ENVIRONMENTAL SCIENCE |
| BIOL 350 | CANCER BIOLOGY                        |
| BIOL 351 | GENERAL GENETICS                      |
| BIOL 360 | MICROBIOLOGY                          |
| BIOL 364 | PROTEIN STRUCTURE DETERMINATION       |
| BIOL 367 | IMMUNOLOGY                            |
| BIOL 369 | CONSERVATION BIOLOGY: AFRICA          |
| BIOL 371 | THE BIOLOGY OF AGING                  |
| BIOL 391 | MEDICAL INTERNSHIP                    |

**General Education, University Writing Requirement, and Electives**

|                      |     |
|----------------------|-----|
| Courses to total 120 | 21  |
| Total Credit Hours   | 120 |

<sup>1</sup> Must be selected in consultation with an advisor; at least one 300-level laboratory course beyond BIOL 301 CELLULAR & MOLECULAR BIOLOGY

**General Education Requirements**

| Code   | Title   | Credit Hours |
|--|---|--------------|
| <b>Academic Communities of Practice</b>  |   |              |
| ACP 101  | FIRST YEAR SEMINAR <sup>1</sup>                   | 3            |
| ACP 110  | PRIMARY TEXTS                                     | 3            |
| ACP 250  | FOUNDATIONS FOR CHANGE                            | 3            |
| <b>English Composition <sup>2</sup></b>  |   |              |
| ENG 101  | COMPOSITION I: CRITICAL READING & WRITING         | 3            |
| ENG 102  | COMPOSITION II: INTRODUCTION TO ACADEMIC RESEARCH | 3            |
| <b>Humanities</b>  |   |              |
| Select 9 credits from the following subject areas: African-American Studies, Art History, English (excluding ENG 101 and ENG 102), History, Languages, Music, Philosophy, Theatre, Speech and Women's and Gender Studies |   | 9            |
| <b>Mathematics</b>   |   |              |
| MATH 110   | QUANTITATIVE LITERACY (or above) <sup>3</sup>     | 3            |
| <b>Non-Western requirement</b>   |   |              |
| Non-Western course (can be used for Humanities or Social Sciences general education requirements)  |   | 3            |
| <b>RU mission-related course <sup>2</sup></b>  |   |              |
| LIBS 201   | WRITING SOCIAL JUSTICE                            | 3            |
| <b>Science</b>   |   |              |

One biological science and one physical science required (at least one must be a four-hour lab (not applicable for science majors)) 7-8

**Social Sciences**

Select 9 credits from the following subject areas: African-American Studies, Anthropology, Economics, History, Journalism, Philosophy, Political Science, Psychology, Sociology and Women's and Gender Studies 9

Total Credit Hours 49-50

<sup>1</sup> Required for students who enter RU with fewer than 12 credit hours

<sup>2</sup> Minimum grade of C- required

<sup>3</sup> Math, Computer Science & Technology, and Science majors have different requirements—see advisor

These quantitative requirements also apply to degrees in the College of Arts and Sciences:

- Students may apply no more than 60 credit hours of 100-level courses toward the degree.
- Students must apply no fewer than 60 credit hours of 200- and 300-level courses toward the degree.
- Students must have at least 18 credit hours (of the 60 credit hours above) at the 300 level.
- Students may transfer in no more than 66 credit hours from community colleges.
- Students must take their final 30 hours at Roosevelt University. Note that some majors have additional requirements for RU hours.
- Students must have a grade point average of 2.0 or higher to graduate. Note that some majors have additional GPA requirements.
- Students must have a minimum of 90 hours in Arts and Sciences.
- Students may apply no more than 51 hours in the major (BA) or 57 hours in the major (BS)

Your degree map is a general guide suggesting courses to complete each term on the academic pathway to your degree. It is based on the most current scheduling information from your academic program. Your program's degree map is reviewed annually and updated as schedules change (although you retain the same course requirements as long as you are continuously enrolled in your degree program).

Always work closely with your academic advisor to understand curriculum requirements and scheduling, as each student's academic plan can look slightly different.

**Year 1**

| Fall     | Credit Hours | Spring   | Credit Hours |
|----------|--------------|----------|--------------|
| ACP 101  | 3            | ACP 110  | 3            |
| CHEM 201 | 5            | BIOL 201 | 5            |
| ENG 101  | 3            | CHEM 202 | 5            |
| MATH 121 | 3            | ENG 102  | 3            |
|          |              | 14       | 16           |

**Year 2**

| Fall     | Credit Hours | Spring   | Credit Hours |
|----------|--------------|----------|--------------|
| BIOL 202 | 5            | BIOL 301 | 5            |
| CHEM 211 | 5            | CHEM 212 | 5            |
| MATH 217 | 3            | MATH 122 | 3            |

|               |    |    |
|---------------|----|----|
| Humanities #1 | 3  |    |
|               | 16 | 13 |

**Year 3**

| Fall                           | Credit Hours Spring              | Credit Hours |
|--------------------------------|----------------------------------|--------------|
| BIOL 3XX with Lab <sup>3</sup> | 5 ACP 250 or LIBS 201            | 3            |
| LIBS 201 or ACP 250            | 3 BIOL 3XX Elective <sup>3</sup> | 3            |
| MATH 231                       | 5 MATH 232                       | 5            |
| Social Science #1              | 3 Humanities #2                  | 3            |
|                                | 16                               | 14           |

**Year 4**

| Fall                           | Credit Hours Spring                       | Credit Hours |
|--------------------------------|---|--------------|
| BIOL 3XX Elective <sup>3</sup> | 3 BIOL 3XX Elective <sup>3</sup>          | 3            |
| PHYS 201                       | 4 PHYS 202                                | 4            |
| PHYS 233                       | 1 PHYS 234                                | 1            |
| Social Science #2              | 3 Social Science #3                       | 3            |
| Humanities #3                  | 3 Non-Western Studies Course <sup>4</sup> | 3            |
|                                | General Elective <sup>1</sup>             | 3            |
|                                | 14  | 17           |

Total Credit Hours 120

- <sup>1</sup> Or course towards an optional Minor.
- <sup>2</sup> Any course at the 200 level within the discipline.
- <sup>3</sup> Any course at the 300 level within the discipline.
- <sup>4</sup> This requirement can be fulfilled by other requirements.
- <sup>5</sup> One Natural Science course must have a lab.