Faculty of Arts and Sciences

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Earl Simson, Dean

Joan Dagle, Associate Dean

|  |  |  |
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| Behavioral Health Studies (p. ) | B.S. |  |
| Biology\*\* (p. )  Biotechnology (p. ) | B.S.  B.S. |  |
| Chemistry\*\* (p. ) | B.A. |  |
|  |  |  |

# Biology

**Department of Biology**

**Mission Statement:**

The mission of the Biology Department is to provide students with broad-based knowledge and experience in the investigative methods of life science. We support several curricula including general education, health sciences and undergraduate and graduate studies in biology. A faculty with diverse areas of expertise interacts closely with students in small classes, laboratories and field settings. We emphasize critical thinking skills and experiential learning while nurturing the intellectual development of our diverse student population. We foster scientific literacy such that our students make informed choices and act as responsible citizens.

**Department Chair:**Dana Kolibachuk

**Department Faculty: Professor** Merson; **Associate Professors**Hewins, Hall, Holmes, Kinsey, Kolibachuk, Patterson, Resende da Maia, Roberts, Stilwell; **Assistant Professors** Britt, Carrier, Conklin, DiLibero, Held, Toorie

Students **must** consult with their assigned advisor before they will be able to register for courses.

Biology B.S.

Course Requirements

Courses

|  |  |  |  |
| --- | --- | --- | --- |
| BIOL 111 | Introductory Biology I | 4 | F, Sp, Su |
| BIOL 112 | Introductory Biology II | 4 | F, Sp, Su |
| BIOL 213W | Plant and Animal Form and Function | 4 | F, Sp |
| BIOL 241 | Biology Research Colloquium | 0.5 | F, Sp |
| BIOL 314 | Genetics | 4 | F |
| BIOL 318 | Ecology | 4 | F |
| BIOL 320 | Cell and Molecular Biology | 4 | Sp |
| BIOL 460W | Biology Senior Seminar | 3 | F, Sp |

Note: BIOL 241: (take twice for 0.5 credits each)

THREE ADDITIONAL COURSES in biology at the 300-level or above

(One of the three courses may consist of 3 or more credits in BIOL 491-494.)

Cognates

|  |  |  |  |
| --- | --- | --- | --- |
| CHEM 103 | General Chemistry I | 4 | F, Sp, Su |
| CHEM 104 | General Chemistry II | 4 | Sp, Su |
| CHEM 205W | Organic Chemistry I | 4 | F |
| CHEM 206W | Organic Chemistry II | 4 | Sp |
|  |  |  |  |
| MATH 240 | Statistical Methods I | 4 | F, Sp, Su |
|  | -Or- |  |  |
| BIOL 240 | Biostatistics | 4 | As needed |
|  |  |  |  |
| MATH 209 | Precalculus Mathematics | 4 | F, Sp, Su |
|  | -Or- |  |  |
| MATH 212 | Calculus I | 4 | F, Sp, Su |
|  |  |  |  |
| PHYS 101 | Physics for Science and Mathematics I | 4 | F, Sp, Su |
|  | -And- |  |  |
| PHYS 102 | Physics for Science and Mathematics II | 4 | F, Sp, Su |

Total Credit Hours: 69-72

Biotechnology B.S.

Course Requirements

Courses

|  |  |  |  |
| --- | --- | --- | --- |
| BIOL 111 | Introductory Biology I | 4 | F, Sp, Su |
| BIOL 112 | Introductory Biology II | 4 | F, Sp, Su |
| BIOL 314 | Genetics | 4 | F |
| BIOL 320 | Cell and Molecular Biology | 4 | Sp |
| BIOT 270W | Introduction to Biotechnology | 4 | F |
| BIOT 370 | Biotechnology Techniques | 4 | Sp |
| BIOT 465W | Biotechnology Internship Seminar | 2 | F, Sp |
| BIOT 406-410 | Biotechnology Internship Experience | 6-10 | F, Sp |
| Note: A minimum of 6 credits is required for the internship experience (BIOT 406-410). Additional internships taken during different semesters do not count toward the major but count as general electives towards the 120 credits needed for graduation. | | | |

Cognates

|  |  |  |  |
| --- | --- | --- | --- |
| CHEM 103 | General Chemistry I | 4 | F, Sp, Su |
| CHEM 104 | General Chemistry II | 4 | Sp, Su |
| CHEM 205W | Organic Chemistry I | 4 | F |
| CHEM 206W | Organic Chemistry II | 4 | Sp |
|  |  |  |  |
| MATH 240 | Statistical Methods I | 4 | F, Sp, Su |
|  | -Or- |  |  |
| BIOL 240 | Biostatistics | 4 | As needed |
|  |  |  |  |
| MATH 209 | Precalculus Mathematics | 4 | F, Sp, Su |
|  | -Or- |  |  |
| MATH 212 | Calculus I | 4 | F, Sp, Su |
|  |  |  |  |
| CSCI 157 | Introduction to Algorithmic Thinking in Python | 4 | F, Sp |
|  | -Or- |  |  |
| PHYS 110 | Introductory Physics | 4 | F, Sp, Su |

**Science Electives**

**TWO COURSES from**

|  |  |  |  |
| --- | --- | --- | --- |
| BIOL 330 | Developmental Biology of Animals | 4 | As needed |
| BIOL 348 | Microbiology | 4 | F, Sp, Su |
| BIOL 429 | Medical Microbiology | 4 | As needed |
| BIOL 431 | Immunology | 3 | As needed |
|  |  |  |  |
| CHEM 404W | Analytical Chemistry | 4 | Sp (even years) |
|  | -Or- |  |  |
| CHEM 416W | Environmental Analytical Chemistry | 4 | Sp (odd years) |
|  |  |  |  |
| CHEM 422 | Biochemistry Laboratory | 3 | Sp |
| CHEM 425 | Advanced Organic Chemistry | 4 | F (odd years) |
| CSCI 209 | Discrete Structures Using Python | 4 | F, Sp |
| MATH 245 | Principles of Data Science | 4 | F, Sp |
| PHYS 309 | Nanoscience and Nanotechnology | 4 | F (even years) |

Technology Liberal Arts Elective

ONE COURSE from

|  |  |  |  |
| --- | --- | --- | --- |
| ANTH 334 | Steamships and Cyberspace: Technology, Culture, Society | 4 | Alternate years |
| HIST 108 | History of Science and Medicine | 4 | Annually |
| PHIL 207 | Technology and the Future of Humanity | 3 | F, Sp |
| PHIL 320 | Philosophy of Science | 3 | Sp (odd years) |

Total Credit Hours: 69-76

Biology Minor

Course Requirements

The minor in biology consists of a minimum of 21 credit hours, as follows:

Courses

|  |  |  |  |
| --- | --- | --- | --- |
| BIOL 111 | Introductory Biology I | 4 | F, Sp, Su |
| BIOL 112 | Introductory Biology II | 4 | F, Sp, Su |
| BIOL 213W | Plant and Animal Form and Function | 4 | F, Sp |

and a minimum of 9 additional credits from BIOL 231 or any others at the 300-level or above.

Total Credit Hours: 21-24

\*\*BIOT COURSE DESCRIPTIONS (after BIOL, before CTE)\*\*

# BIOL - Biology

BIOL 100 - Fundamental Concepts of Biology (4)

Unifying concepts from various levels of biological organization are considered. This course is for students pursuing studies other than the natural sciences. Lecture and laboratory. 6 contact hours. Not open to biology and clinical laboratory science majors. Students cannot receive credit for both BIOL 100 and BIOL 109.

General Education Category: Natural Science.

Prerequisite: Completed college mathematics competency.

Offered: Fall, Spring, Summer.

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BIOL 691-696 - Directed Research (1-6)

Students investigate an experimental question in biology under the direction of an advisor.

Prerequisite: Enrollment in the C.G.S. in Modern Biological Sciences or M.A. in Biology program and consent of advisor and department chair.

Offered: Fall, Spring, Summer.

# BIOT - BIOTECHNOLOGY

BIOT 270W - Introduction to Biotechnology (4)

Students will learn concepts and laboratory techniques relevant to biotechnology with an emphasis on drug discovery and development. Students will write lab notebook entries, standard operating protocols, and scientific reports. This is a Writing in the Discipline (WID) course. Lecture and laboratory. 6 contact hours.

Prerequisite: BIOL 314 with a grade of C or better and CHEM 205W.

Offered: Fall

BIOT 370 – Techniques in Biotechnology (4)

Emphasis is on protein expression techniques and principles important for the manufacturing of biological drug products. The course will also cover the regulatory framework for drug manufacturing. Lecture and laboratory. 6 contact hours.

Prerequisite: BIOL 314 with a grade of C or better and CHEM 205W.

Offered: Spring

BIOT 406-410 – Biotechnology Internship Experience (6-10)

This internship experience will provide students critical training and experience in an intensive work environment within the biotechnology sector. 24-40 contact hours.

Prerequisite: Minimum grade of B- in BIOT 270W and BIOT 370. Favorable lab competency evaluations from three lab science instructors from RIC, with at least one from a BIOT course**.** Concurrent enrollment in BIOT 465W.

Offered: Fall, Spring

BIOT 465W –Biotechnology Internship Seminar (2)

Students will practice communication skills relevant to the biotechnology industry by writing summary documents and giving research presentations. Material will be drawn from the internship experience and the scientific literature. This is a Writing in the Discipline (WID) course. 2 contact hours.

Prerequisite: Concurrent enrollment in BIOT 406-410.

Offered: Fall, Spring

# CTE - Career and Technical Education

CTE 300 - Methods of Teaching Career and Technical Education (4)

Students are introduced to teaching career and technical education at the secondary and post-secondary levels. Topics include basic planning and teaching skills, writing skills, and strategies for identifying, organizing, and presenting lessons. (Only open to students enrolled for career and technical education certification.)

Prerequisite: CEP 215 or equivalent, with minimum grade of C; minimum GPA of 2.50 in all previous courses; or consent of department chair.

Cross-Listed as: TECH 406.

Offered: Spring.

CTE 302 - Curriculum Construction in Career and Technical Education (3)

Students develop the competencies needed to identify, write, and implement a curriculum in their occupational area. (Only open to students enrolled for career and technical education certification.)

Prerequisite: CEP 215 and FNED 246.

Offered: Spring.