

## Biology

### Programs: A.A., B.S., Minor, and Research Certificate

#### Department of Biology

#### School of Arts and Sciences

Science Building 330 \_ 260-481-6305 \_ [www.ipfw.edu/bio](http://www.ipfw.edu/bio)

The study of biology helps you prepare for careers in research, teaching, industry, government, medicine, medical technology, and several other health-related fields. More than half of all graduates earning a B.S. in biology from IPFW go on to graduate studies, either for advanced degrees or for professional certification.

Biology is among the most interdisciplinary of all sciences and requires a broad background in chemistry, physics, and mathematics, as well as biology. This background enables biologists to study the evolution of life; the manifestations of life from the level of viruses, bacteria, and individual cells to the structure and function of organisms; and the interactions of living organisms with each other and with their environments. The Department of Biology has new facilities for its teaching and research programs, and its faculty represent many different fields within biology. Interested students can participate in research projects or in other forms of scholarly activity with individual faculty members (see Special Assignments in Biology under Options in Biology, below). An Associate of Arts with a concentration in biology is described under Arts and Sciences in Part 3 of this *Bulletin*. Two related programs leading to a B.S. are available: life science teaching certification and medical technology. These are described later in this part of the *Bulletin*. A minor in biology is also available.

### **B.S. WITH A MAJOR IN BIOLOGY**

To earn a B.S. with a major in biology, you must fulfill the requirements of IPFW and of the School of Arts and Sciences (see Parts 3 and 7); earn a GPA of 2.30 or higher in BIOL 117, 119, 217, 218, 219, and 491 and in A/B-elective courses in biology (listed below); and complete the following courses:

#### **Course Number and Title Credits**

Area I—Linguistic and Numerical Foundations

**COM 114 *Fundamentals of Speech Communication* 3**

One of the following: **3**

**ENG W131 *Elementary Composition I***

**ENG W140 *Elementary Composition—Honors***

**MA Mathematics course approved 3**

for IPFW General Education Area I

Area II—Natural and Physical Sciences

**BIOL 117 *Principles of Ecology and Evolution* 0**

*(credits included in Biology Core, below)*

**CHM 115 *General Chemistry* 0**

*(credits included in Supporting Courses, below)*

Area III—The Individual, Culture, and Society **6**

*See Part 2 General Education Requirements for approved courses*

Area IV—Humanistic Thought **6**

*See Part 2 General Education Requirements for approved courses*

Area V—Creative and Artistic Expression **3**

*See Part 2 General Education Requirements for approved courses*

Area VI—Inquiry and Analysis

One of the following (credits included in **0**)

Supporting Courses, below):

**CHM 224 *Introductory Quantitative Analysis***

**CHM 321 *Analytical Chemistry I***

**School of Arts and Sciences Requirements**

*English Writing*

**ENG W233 *Intermediate Expository Writing 3***

*(or other approved writing course)*

*Foreign Language*

**Requirements in Arts and Sciences Part B 8**

**Core and Concentration (Major) Courses**

**BIOL 117 *Principles of Ecology and Evolution 4***

**BIOL 119 *Principles of Structure and Function 4***

**BIOL 217 *Intermediate Ecology 3***

**BIOL 218 *Genetics and Molecular Biology 4***

**BIOL 219 *Principles of Functional Biology 3***

**BIOL 491 *Senior Biology Seminar 1***

**Supporting Courses**

**CHM 115–116 *General Chemistry 8***

One of the following: 4

**CHM 224 *Introductory Quantitative Analysis***

**CHM 321 *Analytical Chemistry I***

One of the following sequences: 8

**CHM 254–255–256–258 *Organic Chemistry and Lab***

**CHM 254–258–261–262 *Organic Chemistry and Lab***

One of the following: 3

**CS 106 *Introduction to Computers***

**CS 107 *Introduction to Computers for***

***Science Majors***

One of the following sequences: 9–16

**MA 229 *Calculus for the Managerial,***

***Social, and Biological Sciences I;***

**STAT 240 *Statistical Methods for Biology; and***

**STAT 340 *Elementary Statistical Methods II***

**(9 credits)**

**MA 229–230\* *Calculus for the Managerial, Social,***

***and Biological Sciences I–II;***

**STAT 240 *Statistical Methods for Biology***

*or*

**STAT 511 *Statistical Methods; and***

**STAT 340 *Elementary Statistical Methods II***

**(12 credits)**

**MA 165–166\* *Analytic Geometry and Calculus I–II***

*(this sequence required for students pursuing a double major*

*in chemistry);*

**STAT 240 *Statistical Methods for Biology***

*or*

**STAT 511 *Statistical Methods; and***

**STAT 340 *Elementary Statistical Methods II***

**(16 credits)**

*\*Most graduate programs in biology require one year of calculus.*

One of the following sequences: 8–10

**PHYS 201–202 *General Physics I–II* (10 credits)**

**PHYS 220–221 *General Physics* (8 credits)**

**General Elective Courses 16**

Those courses with a laboratory are indicated by an asterisk (\*).

You must complete at least one course with a laboratory in each group.

**A-Electives** (*organismal, population, community, and ecosystem*)

**BIOL 335–336 *Animal Behavior and Laboratory*\* 3–4**

**BIOL 345 *Vertebrate Biology*\* 4**

**BIOL 434 *Marine Community Ecology*\* 3**

BIOL 445 *Aquatic Biology*\*3  
BIOL 502 *Conservation Biology* 3  
BIOL 505 *Biology of Invertebrate Animals*\*3  
BIOL 543 *Population Ecology*\*4  
BIOL 556–558 *Physiology I and Laboratory*\*3–5  
BIOL 579 *Fate of Chemicals in the Environment*\*4  
BIOL 580 *Evolution* 3  
BIOL 582 *Ecotoxicology* 3  
BIOL 586 *Topics in Behavior and Ecology* 3  
BIOL 592 *The Evolution of Behavior* 3  
BIOL 598 *Biology of Fish*\*4  
ENTM 306–307 *General Applied Entomology* 3  
*and Laboratory*\*

*B-Electives (molecular, cellular, and organ-system)*

BIOL 215 *Basic Human Anatomy*\*4  
BIOL 315 *Developmental Anatomy*\*4  
BIOL 350 *Plant Physiology*\*4  
BIOL 381–382 *Cell Biology and Laboratory*\*3–4  
BIOL 437 *General Microbiology*\*4  
BIOL 455–456 *Animal Physiology and Laboratory*\*4  
BIOL 506 *Human Molecular Genetics*  
BIOL 509–584 *Molecular Biology and Applications* 3–4  
*and Laboratory*\*  
BIOL 515 *Molecular Genetics* 3  
BIOL 516 *Molecular Biology of Cancer* 3  
BIOL 533 *Medical Microbiology* 3  
BIOL 537–565 *Immunobiology and Laboratory*\*3–4  
BIOL 540 *Biotechnology* 3  
BIOL 544–546 *Principles of Virology and Laboratory*\*3–4  
BIOL 559 *Endocrinology* 3  
BIOL 566–567 *Developmental Biology and Laboratory*\*4  
BIOL 569 *Cellular Neurobiology* 3

#### Free Electives

Sufficient additional credits to bring the total to 124.

Total 124

### **SPECIAL REGULATION FOR BIOLOGY MAJORS**

**Time Limit** All biology courses applied toward graduation must be completed within 10 years from the time the first biology course was completed.

### **BIOLOGY MINOR**

If you are pursuing a major other than biology, you may earn a minor in biology by completing each of the following courses with a grade of C or better and earning at least 10 credits as resident credit at IPFW:

#### Course Number and Title Credits

BIOL 117 *Principles of Ecology and Evolution* 4  
BIOL 119 *Principles of Structure and Function* 4  
BIOL 217 *Intermediate Ecology* 3  
BIOL 218 *Genetics and Molecular Biology* 4  
BIOL 219 *Principles of Functional Biology* 3

Total 18

The research certificate is described under Arts and Sciences in Part 3 of this *Bulletin*.