

## Electives for the Major in Biological Sciences

**(24 credits total, including at least 18 credits at the 300-400 level, 3 labs and one 3-credit course from each of the following departments: 146, 447, 694/115 and 216)**

### **Cell Biology and Neuroscience 01: 146...**

146:245 Fundamentals of Neurobiology (3)(F/S)  
146:270 Fundamentals of Cell & Developmental Biology (3) (F/S)  
146:295 Essentials of Cell Biology & Neuroscience (3)(F/S)  
146:310 Physiological Adaptation: Heart, Stress and Exercise (3) (S)  
146:322 Human Histology (4)(S) **Lab**  
146:328 Human Parasitology (3)(F/S)\*\*  
146:329 Human Parasitology **Lab** (1) (F/S)  
146:356 Systems Physiology (3)(F/S)\*\*  
146:357 Systems Physiology **Lab** (1)(F/S)\*\*  
146:445 Advanced Neurobiology 1 (4)(F)  
146:446 Advanced Neurobiology **Lab** 1 (1) (S)  
146:447 Advanced Neurobiology II (3)(S)  
146:448 Advanced Neurobiology II **Lab** (3)(S)  
146:450 Endocrinology (3) (F)  
146:456 Advanced Physiology (3) (F)  
146:464 Topics in Cell Biology & Neuroscience (3)(F)  
146:470 Advanced Cell Biology (3)(F)  
146:471 Advanced Cell Biology **Lab** (3)(S)  
146:472 Advanced Developmental Biology (3)(S)  
146:474 Immunology (3)(F)  
146:475 Immunology **Lab** (1)(S)  
146:478 Molecular Biology (3)(S)\*\*

### **Genetics, 01:447...**

447:203 Honors Computational Genetics (3) (F)  
447:216 Analysis of Scientific Literature (3)(S)  
447:245 Intro to Cancer (3)(F/S) (credit not given for this and 447:495)  
447:302 Quantitative Biology & Bioinformatics (3)(S)  
447:303 Computational Genetics of Big Data (3) (S)  
447:315 Intro to Research in Genetics (3)(S) **Lab**(694/447)  
447:352 Genome Evolution (3) (S)  
447:354 Social, Legal and Ethical Implications of the New Genetics (3)(F)  
447:356 Evolutionary Medicine (3) (S)  
447:370 Developmental Genetics (3) (S)  
**447:380 Genetics (4)(F/S) Elective for Biology minors only**  
447:382 Genetics **Lab** (1)(F/S)  
447:384 & 385 Genetic Analysis I (F) & II (S) (4)  
447:390 General Microbiology (4)(F/S) **Lab**\*\*  
447:392 Pathogenic Microbiology (3) (F)  
447:430 Effective Communication Skills in Genetics (3) (F/S)  
447:451 Genomes (3) (F/S) \*\*  
447:460 Genetics of Compulsive Behavior (3)(S)  
447:465 Mutant Isolation and Analysis (3)(F)  
447:478 and 479 Special Topics in Genetics (3)(F)  
447:480 Topics in Molecular Genetics (3)(F)  
447:481 Topics in Human Genetics (3)(F)  
447:484 Behavioral and Neural Genetics (3) (S)  
447:486 Evolutionary Genetics (3) (S)

**Courses Offered  
through the Division  
of Life Sciences:  
146, 447, 694**

### **Molecular Biology and Biochemistry 01:694...**

694:214 or 215 Intro. to Research in Molecular Biology (215 is Honors) (3) **Lab**  
694:230 Analytical Methods In Biology (3) (S)  
694:301 Introductory Biochemistry & Molecular Biology \*\* (3) (F/S)  
694:313 Intro to Biochem **Lab** \*\* (1)  
694:315 Intro to MBB Research **Lab** (3)(S) (447 or 694)  
694:407 Biochemistry\*\* (3)(F)  
694:408 Molecular Biology (3)(S)\*\*  
694:411 Molecular Pathways (3)(F)  
694:412 Proteomics and Function Genomics (3)(S)  
694:413 Chromatin and Epigenomics (3)(F)  
694:414 Harnessing Solar Energy (3) (S)  
694:420 Special Topics in MBB: Analyzing Numbers in Biology(3)(F)  
694:421 Special Topics in Molecular Biology and Biochemistry(3)(S)  
694:492 Gene Regulation in Cancer and Development (3)(S)

**\*\*Please see the  
reverse side for a list  
of course conflicts. \*\***

### **Department of Biochemistry 11:115...**

11:115:301 Intro Biochemistry (3)\*\*  
11:115:313 Intro Biochemistry **Lab** (1) \*\*  
11:115:403, 404 General Biochemistry (4,3)\*\*  
11:115:412 Protein and Enzyme Chemistry (3)  
11:115:413, 414 Experimental Biochemistry (3,3) **Lab**  
11:115:422 Biochemical Mechanisms of Toxicology (3)  
11:115:452 Biochemical Separations (3)

### **Ecology, Evolution and Natural Resources 11:216... (formerly 704)**

11:216:240 Behavioral Biology (4) (does NOT include lab) (S)  
11:216:251 Fundamentals of Evolution (3) (S)  
11:216:269 Evolution of Animal Behavior (3) (F) (credit not given for this and 11:216:441)  
11:216:302 Parasite Ecology (4) **Lab** (F)  
11:216:317 Conservation Ecology (3) (F/S)  
11:216:323 Ornithology (4) **Lab** (S)  
11:216:324 Invertebrate Zoology (4) **Lab** (F)  
11:216:325 Vertebrate Zoology (4) **Lab** (S)  
11:216:332 Plant Ecology (4) **Lab** (F)  
11:216:335 Freshwater Ecology (formerly Limnology) (4) **Lab** (S)  
11:216:351 Principles of Ecology (3) (S)  
11:216:352 Principles of Ecology **Lab** (1) (S)  
11:216:353 Experimental Evolution (4) **Lab** (Summer)  
11:216:360 Animal Physiological Ecology (3) (F)  
11:216:401 Evolution of Eukaryotes (3) (F)  
11:216:405 Evolution of Infectious Diseases (3) (S) odd years only  
11:216:406 Pollination Ecology **Lab** (4) (S)  
11:216:411 Plant Diversity & Evolution (3) (F)  
11:216:412 Plant Diversity & Evolution **Lab** (1) (F)  
11:216:421 Wetland Ecology (3) (F) odd year only  
11:216:422 Soil Organismal Diversity (3) (S) (effective Spring 2020)  
11:216:423 Fundamentals of Genomics (3) (S)  
11:216:428 Conversational Mathematical Modeling of Bio. Systems (3) (S)  
11:216:441 Animal Behavior (3) (S) (credit not given for this and 11:216:269)  
11:216:451 Global Change and Ecology (3) (F)  
11:216:454 Molecular Ecology (3) (F)  
11:216:464 Wildlife Ecology and Conservation **Lab** (4)(F)  
11:216:469 Wildlife Diseases (3) (S)  
11:216:486 Principles of Evolution (3) (S)  
11:216:487 Urban Ecology (3) (S)  
11:216:488 Restoration Ecology (4) **Lab** (S)

### **Exercise Science**

- 01:377:213 Functional Human Anatomy (4) \*\*  
01:377:370 Exercise Physiology (3)  
01:377:371 Exercise Physiology **Lab** (1)

### **Animal Science**

- 11:067:300 Integrative Physiology (4)\*\* **Lab** (effective Spring 2017)  
11:067:300 Integrative Physiology (4)\*\*  
11:067:301 Integrative Physiology **Lab** (1) \*\* (no longer offered effective Spring 2017)  
11:067:327 Animal Reproduction (3)  
11:067:391 Comparative Mammalian Anatomy (3) \*\*  
11:067:404 Animal Diseases (3) \*\*  
11:067:410 Neuroendocrinology (3)  
11:067:430 Animal Microtechniques and Tissue Culture (4) **Lab**  
11:067:450 Endocrinology (4)  
11:067:490 Pathophysiology (3)  
11:067:491 Reproductive & Developmental Toxicology (3)  
11:067:492 Molecular and Cellular Physiology (3)

### **Biotechnology**

- 11:126:383 Nucleotide Sequence Analysis (3)  
11:126:405 Microbial Technology (3)  
11:126:406 Plant Gene Transfer (2.5) **Lab**  
11:126:407 Comparative Virology (3)  
11:126:413 Plant Molecular Biology (3)  
11:126:420 Trends in Biotechnology (3)  
11:126:427 Methods and Applications in Molecular Biology (4) **Lab**  
11:126:444 Advanced Technologies in Biosciences (3)  
11:126:481 Molecular Genetics (3)\*\*  
11:126:482 Molecular Genetics **Lab** (4)  
11:126:483 Nucleotide Sequence Analysis (3)  
11:126:486 Analytical Microbiology (3) **Lab**

### **Criminal Justice**

- 01:202:351 Forensic Science I (4)  
01:202:352 Forensic Science II (4) **Lab**

### **Entomology**

- 11:370:381 Insect Biology (4) **Lab**  
11:370:402 Aquatic Entomology (4)  
11:370:403,404 Insect Structure and Function I, II (4, 3) **Lab**

### **Environmental Science**

- 11:375:312 Environmental Microbiology **Lab** (2)  
11:375:411 Environmental Microbiology (3)  
11:375:453 Soil Ecology (3)

### **Marine Sciences**

- 11:628:321 Ichthyology (4) **Lab**  
11:628:404 Fungi and Ecosystems (3)  
11:628:462 The Biology of Living In the Ocean: Boundary Ecosystems & Processes (3)

### **Microbiology**

- 11:680:390 General Microbiology (4) **Lab**\*\* (fulfills 447 subject area requirement)  
11:680:480 Microbial Genetics and Genomics (3) \*\*  
11:680:491 Microbial Ecology and Diversity (3)  
11:680:492 Microbial Ecology and Diversity **Lab** (3)  
11:680:494 Applied Microbiology (4) **Lab**

### **Nutrition**

- 11:709:400 Advanced Nutrition I: Regulation of Macronutrient Metabolism (3)  
11:709:401 Advanced Nutrition II: Energy and Micronutrient Metabolism (3)

### **Plant Biology and Pathology**

- 11:776:302 General Plant Pathology (3) (formerly 11:770:301)  
11:776:311 General Plant Pathology **Lab** (1) (formerly 11:770:311)  
11:776:382 Plant Physiology (4) **Lab**  
11:776:405 Plant Biosecurity (3)  
11:776:452 Plant Tissue Culture (3) **Lab**

### **\*\* Course Conflicts\*\***

**Credit not given for more than one of the following courses in each group:**

**Biochemistry: 01:694:301 or 01:694:407 or 11:115:301 or 11:115:403**

**Biochemistry Lab: 11:115:313 or 01:694:313**

**Molecular Biology: 01:146:478 or 01:694:408 or 11:126:481**

**Microbiology: 01:447:390 or 11:680:390**

**Endocrinology: 01:146:450 or 11:067:450**

**Physiology: 01:146:356 or 11:067:300**

**Physiology lab: 01:146:357 or 11:067:300**

**Anatomy: 01:377:213 or 11:067:391**

**Parasitology: 01:146:328 or 11:067:404**

**Genomes: 01:447:451 or 11:680:480 or 11:216:423 or 11:115:423**