

## Approved Life Science 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 Approved Electives (01:146):**

146:245 Fundamentals of Neurobiology (3)(F/S)  
146:270 Fundamentals of Cell Biology (3) (F/S)  
146:295 Essentials of Cell Biology & Neuroscience (3)(F/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 Synapses, Neurons, and Circuits (previously Adv Neuro I)(4)(F)  
146:446 Advanced Neurobiology **Lab** 1 (1) (S)  
146:447 Clinical Neurobiology (previously Adv Neuro II ) (3)(F/S)  
146:448 Advanced Neurobiology II **Lab** (3)(S)  
146:456 Advanced Physiology (3) (F)  
146:464 Neurobiology of Pain and Addiction (3)(F/S) (previously Topics in CBN)  
146:470 Advanced Cell Biology I (3)(F)  
146:472 Developmental Biology (3)(S) (previously Adv Dev. Bio)  
146:473 Genetic Regulation of Cell Biology (3)(F) (previously Adv Cell Bio I)  
146:474 Immunology (3)(F)  
146:475 Lab in Immunology **Lab** (1) (S)  
146:476 Honors Immunology (3) (S)  
146:481 Protein Dynamics in Cell Biology (3)(S)

### **Genetics Approved Electives (01:447):**

447:203 Honors Computational Genetics (3)(F)  
447:245 Intro to Cancer (3)(S)  
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) (F)  
447:370 Developmental Genetics (3) (F)  
**447:380 Genetics (4)(F/S) Elective for Biology minors only**  
447:382 Genetics **Lab** (1)(F/S)  
447:390 General Microbiology (4)(F/S) **Lab**\*  
447:392 Pathogenic Microbiology (3) (S)  
447:451 Genomes (3) (F/S)  
447:460 Genetics of Compulsive Behavior (3)(S)  
447:465 Genetic Approaches and Research Analysis (3)(F)  
447:470 Evolutionary Developmental Biology (3) (S)  
447:484 Behavioral and Neural Genetics (3) (S)  
447:486 Evolutionary Genetics (3) (S)

### **Molecular Biology and Biochemistry Approved Electives (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 or 316 Intro to MBB Research (3)(S) (316 is Honors) **Lab** (694/447)  
694:390 Introductory Computational Biology (3) (S)  
694:395 Biochemistry for Life Sciences \* (3)(F/S)  
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)  
694:421 Special Topics in Molecular Biology and Biochemistry(3)(S)  
694:492 Gene Regulation in Cancer and Development (3)(S)

### **Biochemistry Approved Electives (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)

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

### **Ecology, Evolution and Natural Resources Approved Electives (11:216):**

11:216:240 Behavioral Biology (4) (does NOT include lab) (F)  
11:216:251 Fundamentals of Evolution (3) (S)  
11:216:269 Evolution of Animal Behavior (3) (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)  
11:216:351 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)  
11:216:405 Evolution of Infectious Diseases (3) (S) odd years only  
11:216:411 Plant Diversity & Evolution (3) (F)  
11:216:412 Plant Diversity & Evolution **Lab** (1) (F)  
11:216:421 Wetland Ecology (4) **Lab** (F) odd year only  
11:216:422 Soil Organismal Diversity (3) (S)  
11:216:428 Conversational Mathematical Modeling of Bio. Systems (3) (S)  
11:216:441 Animal Behavior (3) (S)  
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)  
11:216:486 Principles of Evolution (3) (S)  
11:216:487 Urban Ecology (3) (S)

**Exercise Science Approved Electives:**

- 01:377:223 Functional Human Anatomy (3)  
01:377:224 Functional Human Anatomy Lab (1) - Will only count for life science elective credit only—will **NOT** fulfill a Life Science elective lab requirement  
01:377:370 Exercise Physiology (3)  
01:377:371 Exercise Physiology **Lab** (1)

**Animal Science Approved Electives:**

- 11:067:300 Integrative Physiology (4)\* **Lab**  
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 Approved Electives:**

- 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)  
11:126:486 Analytical Microbiology (3) **Lab**

**Criminal Justice Approved Electives:**

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

**Entomology Approved Electives:**

- 11:370:320 Insect Ecology & Evolution (3)  
11:370:380 Insect Biotechnology (3)  
11:370:381 Insect Biology (4) **Lab**  
11:370:403 Insect Structure and Function (4) **Lab**  
11:370:406 Medical & Veterinary Entomology (3)  
11:370:414 Forensic Entomology (3)

**Environmental Science Approved Elective:**

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

**Marine Sciences Approved Electives :**

- 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 Approved Electives :**

- 11:680:390 General Microbiology (4) **Lab\*\*** (fulfills 447 subject area requirement)  
11:680:475 Microbiomes and Health (3)  
11:680:480 Microbial Genetics and Genomics (3)  
11:680:491 Microbial Ecology and Diversity (3)  
11:680:492 Experiments in Microbial Ecology and Diversity **Lab** (3) (an EBE for SEBS)  
11:680:494 Applied Microbiology (4) **Lab**

**Nutrition Approved Electives :**

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

**Plant Science Approved Electives:**

- 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**

**Out of Classroom Learning Experiences\*\*:****Biological Sciences (01:119) Approved Electives:**

- 01:119:201, 202 Independent Study in Biology (1-3)  
01:119:307, 308, 406, 407 Research in Biology (1-4) **Lab\*\*\***  
01:119:408, 409 Honors in Biology (3-6) **Lab\*\*\***

\*\*Maximum of 6 credits in total can be applied toward the major from this type of coursework.  
\*\*\*May only be applied 1 time toward the 3 lab requirement.

\* **Course Conflicts\***

Credit not given for more than one of the courses listed per each row of courses below:

**Animal Behavior:** 11:216:269 or 11:216:441

**Anatomy:** 01:377:213 or 01:377:223/224 or 11:067:391

**Biochemistry:** 01:694:301 or 01:694:407 or 11:115:301 or 11:115:403 or 01:694:395

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

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

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

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

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

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

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

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