## 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 & Developmental 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)
- 146:340 Virology (3) (F)
- 146:356 Systems Physiology (3) (F/S)*
- 146:357 Systems Physiology Lab (1) (F/S)*
- 146:445 Advanced Neurobiology I (4) (F)
- 146:446 Advanced Neurobiology Lab I (1) (S)
- 146:447 Advanced Neurobiology II (3) (S)
- 146:448 Advanced Neurobiology II Lab (3) (S)
- 146:456 Advanced Physiology (3) (F)
- 146:464 Topics in Cell Biology & Neuroscience (3) (S)
- 146:470 Advanced Cell Biology I (3) (F)
- 146:471 Advanced Cell Biology Lab (3) (S)
- 146:472 Advanced Developmental Biology (3) (S)
- 146:474 Immunology (3) (F)
- 146:475 Lab in Immunology Lab (1) (S)
- 146:476 Honors Immunology (3) (S)
- 146:480 Advanced Cell Biology II (3) (S)

### Genetics Approved Electives (01:447):
- 447:203 Honors Computational Genetics (3) (F)
- 447:216 Analysis of Scientific Literature (3) (S)
- 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)
- 694:407 Biochemistry** (3) (F)
- 694:408 Molecular Biology (3) (S)**
- 694:411 Molecular Pathways Lab (694/447)
- 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)

### Biochemistry 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)
- 11:216:405 Evolution of Infectious Diseases (3) (S) odd years only
- 11:216:411 Molecular Pathways Lab (3) (F)
- 11:216:441 Animal Behavior (3) (S)
- 11:216:451 Global Change and Ecology (3) (F)
- 11:216:454 Molecular Ecology (3) (F)
- 11:216:486 Principles of Evolution (3) (S)
- 11:216:487 Urban Ecology (3) (S)

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*Please see the reverse side for a list of course conflicts.*
**Exercise Science Approved Electives:**
01:377:223 Functional Human Anatomy (3) *(previously 01:377:213)
01:377:224 Functional Human Anatomy Lab (1) - Will only count for 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)
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)
01:119:408, 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

**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 Lab:** 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