Biology

Bruyninckx, Hughes, Karns, Rubino, Wolford, Worrell.

Major: Biology courses – 115, 161, 162, or 163; 185; 221; 231; 301; 302; 471 (culminating experience); three others, two of which must be at the 300 level, but not to include 307, 308, 357, 370, or 380.  
Cognate courses – Chemistry 161 or equivalent; Che 185; Math 217.  

Comprehensive evaluation with passing grade. Total of 8.50 major course credits, plus 3 cognates = 11.50.  

Minor: Biology courses – 161 or equivalent; 185; any three others, but not to include 301, 302, 308, 370, 371, or 380. Total of 5 minor courses.  

All courses (except 301, 302) include an integrated laboratory experience.  

Bio 121. General Biology II: Systems and Cells. An introduction to the scientific study of life with emphasis on the chemistry of life, cells, molecular genetics, and basic physiology. Not for prospective natural science majors. Prerequisite: 115. Partially satisfies General Degree Requirement III.A.  

Bio 160. Special Topics.  

Bio 161. Heredity and Evolution. An historical approach to explore the development of two primary topics in modern biology: the mechanisms of inheritance and the diversification of life on Earth via the process of evolution. The nature and practice of science will be examined throughout the course. In combination with Che 161, satisfies Natural World LADR or GDR III.A. Not open to students with prior credit in Bio 115 (GDR) or Che 121 (GDR).  

Bio 162. Heredity and Evolution. See Bio 161. In combination with Psy 162, satisfies Natural World LADR or GDR III.A. Not open to students with prior credit in Bio 115 (GDR) or Psy 222.  

Bio 163. Heredity and Evolution. See Bio 161. In combination with Geo 163, satisfies Natural World LADR or GDR III.A. Not open to students with prior credit in Bio 115 (GDR) or Geo 111 or Geo 236.  

Bio 164. Life and Perception I: Heredity and Evolution. See Bio 161. In combination with Psy 164, satisfies Natural World LADR or GDR III.A. Not open to students with prior credit in Bio 115 (GDR) or Psy 224.  

Bio 185. Cells and Systems. An introduction to the scientific study of life with emphasis on the chemistry of life, cells, and physiology. For prospective natural science majors. Prerequisites: 115, 161, 162, or 163 and either Che 121, 161 or equivalent, or permission of instructor. Partially satisfies General Degree Requirement III.A.  


Bio 221. Genetics. A survey of molecular, organismal, and population genetics. Laboratory work illustrates basic genetic principles and modern laboratory techniques. Prerequisites: 120, 185, or consent of instructor. Prerequisite/corequisite: Che 121, 161 or equivalent.  

Bio 227. Herpetology. A study of the biology of amphibians and reptiles. Topics covered include classification, evolution, ecology, physiology, behavior, and conservation. Emphasis on the
amphibians and reptiles of southeastern Indiana and field research methods. Prerequisite: 115, 161, 162, or 163.

**Bio 228. Ornithology.** A study of the biology of birds, with an emphasis on identification and observations of behavior in the field. Prerequisite: 115, 161, 162, or 163.

**Bio 231. Biodiversity.** An introduction to the biological diversity of earth. Topics covered include analysis of the form and function of the major taxonomic groups: protists, fungi, plants, and animals, the origin of life, the evolutionary history of life on earth, and principles of biological classification. Prerequisite: 120, 185, or consent of instructor.

**Bio 233. Biotechnology.** A laboratory-based exploration of how recombinant DNA technology is used in basic and applied research involving microbes, plants, and animals. Prerequisite: 120 or 185.

**Bio 234. Plant Taxonomy.** Identification of higher plants with emphasis on the native flora; emphasis on the use of keys, principles of classification, field work, and herbarium methods. Prerequisite: 115, 161, 162, or 163 or consent of instructor.

**Bio 260. Special Topics.**

**Bio 301. Junior Seminar.** Preparation of an Independent Study proposal including a bibliography, literature review, and an oral presentation. Exploration of career options through seminars presented by professionals from a variety of life science specialties. Prerequisite: 4 courses in biology or junior standing. .25 unit.

**Bio 302. Senior Seminar.** Weekly meetings on current topics in biology and reports on Independent Studies. Prerequisite: 4 courses in biology or senior standing. .25 unit.

**Bio 307. Directed Study.** .50 unit.

**Bio 308. Directed Research.** Field or laboratory research performed under the direction of a professor. Prerequisite: permission of directing professor. Graded Pass/Fail. .25 unit.

**Bio 312. Conservation Biology.** Study of the conservation of genetic, species, and ecosystem diversity, with emphasis on animals. Synthesis of perspectives from population and community ecology, population genetics, biogeography, economics, and sociology. Prerequisite: 231 or consent of instructor.

**Bio 313. Plant Anatomy and Physiology.** Study of vascular plant structure and function as adaptations to the terrestrial environment. Lectures, discussions, laboratories, and field trips. Prerequisite: 231 or consent of instructor.

**Bio 314. Molecular Biology.** A detailed survey of gene structure, function, regulation, and replication as well as the experimental techniques used to understand these phenomena. Prerequisite: 221 or consent of instructor.

**Bio 315. Ecology.** Study of interactions of organisms and their environments; emphasis on energy flow, nutrient cycling, and equilibrium processes in ecosystems. Lectures, field projects, preparation of scientific reports, and laboratories. Prerequisite: 115, 161, 162, or 163 or consent of instructor.

**Bio 316. Animal Behavior.** A study of the behavior of animals, with emphasis on the ecology and evolution of behavior and the applicability of the principles of animal behavior to humans. Prerequisite: Completion of General Degree Requirement III.A.

**Bio 317. Vertebrate Comparative Anatomy.** A study of the biology of the vertebrates, including the evolutionary history and structure and function of the major vertebrate groups. Emphasis in lab on dissection of representative vertebrates. Prerequisite: 115, 161, 162, or 163. Offered alternate years.

**Bio 318. Research Methods in Biology.** Techniques for conducting investigations in the biological sciences: scientific reasoning, literature reviews, design of experiments, analysis of data (including statistical analysis), oral and written presentation of results and the preparation of research proposals. Prerequisite: MAT 217 or consent of instructor.

**Bio 321. Animal Physiology.** A comparative study of the functioning of selected physiological
systems in a variety of animal groups, with an emphasis on the ecological significance of differences among animals. Prerequisite: 185. Prerequisite/corequisite: Che 121, 161, or equivalent.

**Bio 326. Developmental Biology.** Development of organisms with an emphasis on vertebrates. Laboratories will combine modern molecular analyses and classical descriptions of organismal development. Prerequisite: 221.

**Bio 328. Immunology.** Introduction of both theories and techniques in the field of immunology. Prerequisite: 221 or consent of instructor.

**Bio 332. Evolution.** An analysis of the process of evolution. Topics cover the history of evolutionary thought, evidence for the evolution of life, mechanisms of evolutionary change, and the history of life on earth. Special emphasis will be placed on current research and developing an experimental evolutionary approach. Lectures, discussions, field and laboratory experiments. Prerequisite: 231 or consent of instructor.

**Bio 333. Microbiology.** A study of the structure and function of bacteria and related organisms. Prerequisite: 221 or consent of instructor.

**Bio 334. Virology.** A consideration of structure, life histories, and biological impact of representatives of the major classes of viruses. Laboratory activities focus primarily on cultivation and experimentation with bacterial viruses to illustrate principles in viral growth. Prerequisite: Bio 221.

**Bio 336. Cell Biology.** A study of the evolution, structure, and functioning of cells. Topics include membranes, bioenergetics, intracellular sorting, the cytoskeleton, cell communication, and cellular mechanisms of development. Laboratory emphasis on the methodology of cell biology. Prerequisite: 221.

**Bio 357. Internship.** Off-campus supervised experience in biology.

**Bio 360. Special Topics.**

**Bio 370. Directed Study.** One unit.

**Bio 380. Directed Research.** Field or laboratory research performed under the direction of a professor. Prerequisite: Permission of directing professor. Graded Pass/Fail. 1 unit.

**Bio 471. Independent Study.** Individual work on some problem under the direction of a professor; laboratory, library, or field work, culminating in a written report. Prerequisite: Five courses in biology, senior standing, and permission of the directing professor.