

- 2) two courses chosen from business administration 212, 344 and English 211.

BIOLOGY

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A basic assumption underlying the biology curriculum is that all undergraduate biology majors, regardless of future plans for specialization, can profit by taking a required core of courses emphasizing study at the molecular/cellular, organismal, and population/community levels of organization, thereby gaining a broad introduction to the principles of all important areas of modern biology.

Students planning a major sequence in the field of the biological sciences should include in the four-year program of studies as much experience as possible in other sciences (particularly chemistry and physics) and mathematics.

Satisfactory completion of such a program provides the student with the necessary background for: (1) graduate level study; (2) admission to schools of medicine, dentistry, environmental science, forestry, osteopathy, pharmacy, optometry, veterinary medicine, physical therapy or paramedical programs; (3) teaching biology at the secondary level*; and (4) positions in research, industrial laboratories and government field work.

Opportunities for independent study are offered for second, third and fourth-year students in the courses 399, 495 and 499. Biology 395 serves as an introduction to biological research. None of these courses or combinations of any of these courses can be taken for more than two course units.

All students must earn a "C-" or better in General Biology 102 in order to take courses requiring 102 as a prerequisite.

Major Sequence:

A minimum of ten courses in biology to include:

- 1) biology 101 and 102
- 2) two courses in molecular or cellular biology to include genetics (312) and one other course (selected from 240, 314, 317, 330, 407, 410, 412 or 414)
- 3) two courses in systems or organismal biology to include one course in plant biology (306 or 315) and one other course (selected from 219, 302, 307, 310, 311, 313 or 314)
- 4) one course in population or community biology, or in evolutionary biology (selected from 217, 219 or 316)
- 5) three additional courses selected from departmental offerings
- 6) one of the ten courses must have a significant investigative component—research and/or use of primary literature and/or experimental work (selected from 217, 302, 314, 326, 327, 328, 330, 399, 407, 411, 412, 495 or 499)

Cross-listed courses in numbers 2 and 3 (314) and 3 and 4 (219) cannot be counted towards both categories.

Although not required for the biology major, in preparation for many careers in biology students are expected to take:

- 1) four lab courses in chemistry (201, 202, 311, 312)
- 2) two lab courses in physics (101, 102 or 105, 106)
- 3) mathematics through 151 or 161 (or proficiency)

Minor Sequence:

Five courses in biology to include:

- 1) biology 101 and 102
- 2) one course in botany selected from 306 or 315
- 3) two additional biology courses, one of which must be numbered 300 or above.

***Biology majors and minors who desire secondary teaching certificates and/or middle school and subject area endorsements must apply to the Teacher Education program in their sophomore year. Refer to the educational studies curriculum description in this *Catalog* and the *Teacher Education Information Handbook* (<http://www2.iwu.edu/edstudies/handbooks/>) for further information.**

101, 102 General Biology (1.25) (1.25) (LSL) A concentrated introduction to molecular, cellular, genetic, developmental and organismic biology. Emphasis on fundamental principles, concepts and current developments of modern biology. Intended for biology majors, pre-medical, pre-dental and pre-veterinary students, and interested non-majors. Three hours of lecture and three hours of laboratory per week. Prerequisite: 101 for 102. *101 offered each fall; 102 offered each spring.*

104 Plants and Civilization (LSI) A general introduction to the biology of plants and to the importance and usefulness of plants and plant products to humans. Issues related to genetically modified crops and modern agriculture will be included. Credit will not be given toward the biology major. *Offered occasionally.*

107, 108 Human Biology: Anatomy and Physiology (1.25; LSL for 107) (1.25) A concentrated introduction to the biology of human beings. Emphasis on the structure and function of the human body; its organs and organ systems. Prerequisite for 108: successful completion of 107. Five hours of lecture and two hours of anatomy/physiology laboratory per week. Credit for biology majors will be given only by written consent of the department chairman. Credit in biology will not be given for both Human Biology 107-108 and General Biology 101-102. *107 offered each fall; 108 offered each spring.*

110 Biology and Human Concerns (LSI) A general introduction for non-majors to the nature of biology and the impact of modern biological science upon their lives and values. Emphasis will be upon current topical issues in the field, such as genetic and bio-engineering, immunology, fetal transplantation, and population issues. Credit will not be given toward the biology major or minor. *Offered occasionally.*

114 The Microbial World An introduction to the biology of microbes that concentrates on bacteria and viruses. Emphasis on human health issues, on applied microbiology, and on the roles of microbes in the environment. Four hours of lecture and three hours of laboratory per week. Credit will not be given toward the biology major. Prerequisites: Chemistry 110, Biology 107, concurrent enrollment in Biology 108, and consent of instructor. *Offered each spring.*

117 Physiological Myths Participants will consider whether they should accept or reject certain commonly held beliefs that relate to conditions of human function. This requires analyzing the premises on which those beliefs are based and evaluating the scientific methodology that is popularly accepted as support for those premises. This course is intended for the non-major. Credit will not be given toward the biology major or minor. *Offered occasionally in May term.*

120 Ecology and Environmental Problems (LSI) (Cross-listed as Environmental Studies 120) An examination of major environmental concepts, problems and possible solutions. Basic ecological principles will serve as a foundation for discussion of such issues as human

population growth, resource extraction/depletion and pollution. Designed for non-science majors; credit will not be given toward the biology major or minor. *Offered each spring.*

164 The Marine Realm (NSI) This course examines the inspiring diversity of marine life and investigates the interactions of humans with the marine environment. Credit will not be given toward the biology major or minor. *Offered every other year.*

209 Biostatistics and Experimental Design An introduction to statistical theories and tests applied in the analysis of biological data, and to the proper design of scientific experiments. Students will practice asking pertinent questions and critically reading scientific literature in preparing for research projects. Each student will orally review and critique published research articles. Prerequisites: 101 and 102. *Offered in alternate years.*

210 Introduction to Human Evolution (LSL) Examination of the hypotheses about the origin and evolution of the human species and of the pertinent anatomical, behavioral and paleobiological evidence. *Offered occasionally in May term.*

217 Introductory Ecology (1.25) (W) An introduction to the major concepts of ecology; the structure and function of ecosystems, population and community dynamics, and plant and animal adaptations. Four hours of lecture and four hours of laboratory/field work per week. Prerequisites: 101 and 102. *Offered each fall.*

219 Biology of Invertebrates (1.25) This course is a comparative study of the functional morphology, behavior, and ecological and evolutionary relationships of invertebrate animals. Students work with live specimens whenever possible. Four hours of lecture and four hours of laboratory per week. Prerequisites: 101 and 102. *Offered each fall.*

220 Natural History of Illinois (LSL) (cross-listed with ENST 220) The study of natural history is an endeavor in understanding the myriad of parameters that contribute to the complexities of the natural world. This course is designed to explore, through lecture, laboratory, and field studies, the geological, climatic, biological, and ecological aspects of the environment of Illinois. *Offered alternate spring semesters.*

230 Behavioral Ecology An exploration of animal behavior from an evolutionary perspective. After examining the theory of natural selection, this concept will be applied to topics including territoriality, foraging ecology, antipredator behavior, sexual selection, and altruism. An examination of experimental studies testing hypotheses about these behaviors will be used to explore these topics. Prerequisites: 101 and 102. *Offered as needed.*

240 Introduction to Cellular and Molecular Biology (W) An examination of eukaryotic cell structure and function, covering cellular membranes; organelle and cytoskeletal function, biogenesis, and organization. The regulation and coordination of these processes will also be examined. Four hours of lecture and four hours of laboratory per week. Prerequisite: 101, 102 or consent of the instructor. *Offered each fall.*

300 Biology and Ethics (AV, W) A study of ethical and social issues arising out of the rapidly developing fields of reproductive biology and genetics. In the first quarter of the course, students will be introduced to different ethical theories; in the remainder of the semester, they will look at specific ethical issues. Issues examined may include those that arise in connection with RU-486, surrogacy, IVF, sex cell storage, cloning, and human stem cell research. *Offered occasionally.*

302 Parasitology (1.25) (W) An in-depth study of the life histories of parasites and the medical, environmental, and economic impact of parasites to human and animal populations. Emphasis will be placed on evolution of parasite-host relationships and on the environmental consequences and cost of parasite treatment and control. Prerequisites: 101, 102 or 107 and 108 or permission of the instructor. *Offered in alternate years, spring semester.*

306 Plant and Fungal Diversity (1.25) An examination of the major groups of

plants and a consideration of their evolutionary origins and phylogenetic relationships. Four hours of lecture and five hours of laboratory per week. One field trip. Prerequisites: 101 and 102. *Offered each fall.*

307 Animal Physiology (1.25) Principles of normal function in various animals including control system regulation ranging from molecular to organismal levels. Four hours of lecture and four hours of laboratory per week. Prerequisites: 101 and 102, organic chemistry or general physics, or consent of instructor. *Offered each fall.*

309 Biological Techniques Laboratory experience in the use of instruments, equipment and techniques commonly employed in histological preparation. Prerequisites: 101 and 102, consent of instructor. *Offered as needed.*

310 Chordate Comparative Anatomy (1.25) Structural and functional organization and evolution of chordate animals. Four hours of lecture and five hours of laboratory per week. Prerequisite: 101 and 102. *Offered each spring.*

311 Developmental Biology (1.25) Analysis of the development of vertebrate systems, with emphasis on causal mechanisms. Four hours of lecture and four hours of laboratory per week. Prerequisites: 101 and 102. *Offered each spring.*

312 Genetics (LSI) Basic principles of Mendelian, molecular and population genetics. Four hours of lecture. Prerequisites: 101 and 102. *Offered each semester.*

313 Histology (1.25) A microscopic examination of the structure of animal cells, tissues and organs in lab is coupled with an examination of their structural properties and functions in lecture. Three hours of lecture and four hours of laboratory work per week. *Offered each fall.*

314 Microbiology (1.25) Study of microorganisms, emphasizing biology of bacteria and viruses and including basic study of immune responses to antigenic substances. Four hours of lecture and four hours of laboratory per week. Prerequisites: 101, 102 (306 recommended). *Offered each spring.*

315 Plant Anatomy and Physiology (1.25) A study of vascular plant structure and function integrating knowledge of plant anatomy, water relations, metabolism, growth, and development. Three hours of lecture and four hours of laboratory per week. Prerequisites: 101 and 102. *Offered each spring.*

316 Evolution (LSI) An examination of evolutionary theory, covering genetic and biochemical concepts of evolution; adaptation, selection, and the origin of diversity; biogeography; and systematics of plants and animals. Three hours of lecture and one hour of lab/discussion per week. Prerequisites: 101 and 102. *Offered each fall.*

317 Survey of Biochemistry I See Chemistry 317.

320 Marine Biology (G) A survey of the tropical reef marine environment; the biology of marine plants and animals, ecological relationships and community dynamics. Studies will be conducted at a marine station on the Great Barrier Reef in Australia. Prerequisites: 101 and 102 and consent of instructor. Recommended: 217 or 219. No more than two travel courses may count toward 300-level courses in the department. *Offered occasionally in May term.*

321 Conservation Biology Ecological principles and conservation law and policy will serve as a basis to assess human impacts on biological diversity and to develop practical approaches to prevent species extinction. The course will include off-campus lectures and field trips. Topics covered include extinction as an historical/contemporary process, invasive species, global climate change, endangered/threatened species conservation, and watershed/ecosystem management. Prerequisites: 101 and 102. *Offered in alternate years, spring semester.*

325 Terrestrial Biology Field studies of the structure and dynamics of representative

communities of a geographical region. Prerequisites: 101 and 102. Recommended: 217 or 306. No more than two travel courses may count toward 300-level courses in the department. *Offered occasionally in May term.*

326 Topics in Marine Biology A seminar in invertebrate zoology that explores from the primary literature diverse aspects of marine and freshwater animals and the environments in which they live. Prerequisites: 101, 102, and any upper level biology course. *Offered occasionally, spring semester.*

327 Advanced Ecology (W) A detailed examination of selected topics in ecology, such as foraging strategies, life history strategies, and community organization. Three hours of discussion per week. Discussion will focus on critical examination of current literature pertinent to lecture topics. In addition, students will conduct research on a topic of their choice, and summarize their results in an oral presentation and a written paper. Prerequisite: 101 and 102. *Offered occasionally.*

328 Experimental Zoology (1.25) (W) A research-based course that explores fundamental concepts in development, physiology, and life history characteristics of animals by analyzing primary literature and conducting experiments. Students explore model systems in animal biology through in-depth study of a few species of animal. Students also have the opportunity to design and complete their own research projects. Prerequisites: 101, 102, and any 200 level or higher biology course. *Offered in alternate years, spring semester.*

330 Topics in Cell Biology A detailed examination and discussion of selected topics in cell biology. Readings from the primary scientific literature are an integral part of the course. Students will conduct research on a topic of their choice and summarize the research in both a written and oral presentation. Prerequisites: 101, 102; 240 or 2 years of chemistry (recommend: 312). Sophomores interested in course should seek consent of instructor. *Offered each spring.*

350 Tropical Ecology (LSI, G) An examination of the ecosystems, animals and plants of Costa Rica, including issues associated with the preservation of biodiversity. Studies will be conducted both in Costa Rica and in the classroom. Prerequisite: consent of instructor and 102. *Offered in May Term.*

395 Introduction to Research An on-campus introduction to research with a supervising faculty member. Students will be introduced to the research tools and techniques of an area of biological research. Prerequisite: consent of instructor. (1/2 unit; Credit/Non-credit; must have a major or minor in Biology). May not be repeated. *Offered each semester.*

398 Medical Externship In cooperation with physicians of different specialties, these experiences involve full-time observation/participation in the physician's daily routines, including office/clinic hours, hospital rounds, surgery, staff meetings, etc. A daily written log is required. Credit will not count toward the major or minor in biology. Prerequisites: junior standing and consent of instructor. This course is limited to students seriously considering a medical career and who meet the requirements necessary to apply for admission to medical school. (Credit/Non-credit) *Offered each May term.*

399 Off-Campus Research Research will be conducted off-campus in collaboration with a research program approved by the Biology Department chair and a supervising faculty member. The research will be summarized on campus in a scientific paper, and in a poster or oral presentation. Prerequisites: 101 and 102. (1/2 or 1 unit; Credit/Non-credit; must have a major or minor in Biology). May be repeated for a maximum of one course unit. *Offered each semester.*

407 Neurophysiology Neural control systems: receptor design; logic of neuronal networks; neural integration and decision making. Three hours of seminar per week. Prerequisite: 307. *Offered in alternate years, spring semester.*

410 Molecular Foundations of Developmental Biology (W) Examination of

cellular and molecular mechanisms utilized during the developmental process. Discussions include the intercellular communications, regulations of gene expression, and intracellular phenomena that result in the patterning of the embryo and the differentiation of the cell. Evolutionary and medical topics of relevance will also be addressed. At least one of the following courses is recommended: 240, 311, 312. *Offered fall semester.*

411 Experimental Embryology An experimental study of vertebrate development. Laboratory studies will emphasize amphibian and avian development, with emphasis on microsurgery, tissue culture and specialized histological techniques. Prerequisite: 311 and consent of instructor. *Offered as needed.*

412 Molecular Genetics (1.25) (W) The molecular basis of heredity will be discussed—including DNA replication, maintenance of the genome, our present understanding of eukaryotic gene structure, and gene expression. Much of the course is based on papers from the scientific literature. Weekly labs will provide a thorough introduction to the tools and methods currently used in the field of molecular genetics. Three one-hour lectures, one hour discussion and one four-hour lab per week. *Offered in alternate years, spring semester.*

414 Biochemistry See Chemistry 414.

495 Directed Study Individualized directed readings on a topic of interest to the student which is not normally a part of the curriculum. The work may include a laboratory component. It may also include the requirement for the preparation of a significant paper which brings together the results of the study. (1/2 or 1 unit) *Offered each semester.*

499 Research/Thesis Experimental or theoretical examination of an unsolved problem on a topic of interest to the student and cooperating faculty member. A significant paper detailing the findings of the investigation is expected at the conclusion of the work. (1/2 or 1 unit) May be repeated for a maximum of two units. Prerequisite: consent of instructor. *Offered each semester.*

BUSINESS AND ECONOMICS

The Division of Business and Economics offers majors in Accounting, Business Administration, International Business, Risk Management and Economics. Consistent with academic programs throughout Illinois Wesleyan University, the mission of the Division is to prepare students for life-long learning. Faculty attempt to do more than simply meet incoming students' expectations of their academic experience; we hope to shape those expectations as well. In particular, faculty in the Division are committed to the following activities: awakening students to the excitement of learning; exposing students to technological, analytical, research, and communication skills necessary to function successfully in managerial or organizational careers; preparing students for advanced graduate programs, particularly in law, business, international relations, economics, or related fields; helping students to function independently in a professional environment immediately upon graduation; sensitizing students to a global world in which respect for cultural and intellectual diversity is essential; and encouraging students to consider at all times how their actions and those of organizations of which they are a part affect society.

Through course work and co-curricular activities sponsored by the Division, faculty encourage students to gain an awareness of their own potential and an appreciation of the accompanying obligations: working up to that potential,