

BI-151 Biological Reasoning

Catalog Description (including prerequisites)

Using scientific reasoning and evidence from various biological disciplines to test hypotheses about the common ancestry of organisms. Three one-hour lectures. Prerequisites: Eligibility for EN 100.

Course Content

This course explores evidence relating to the common ancestry of organisms on Earth. It is divided into a series of units, covering the process of science, comparative study of skeletons of vertebrates, fossil evidence, the genetic code, and comparative study of molecular biology of organisms.

Nature of Course

Students proceed by developing their own hypotheses about the origin and relatedness of organisms. These hypotheses are tested against anatomical and molecular evidence in a series of units. Student record their hypotheses, predictions, results, and conclusions, along with their reasoning processes, in ongoing journal entries during the course. In the process the students are exposed to a variety of types of biological evidence along with the tools for locating and analyzing it, and gain experience in application of scientific reasoning to a problem.

Student Expectations

Attend all classes, participate in all class activities, and satisfactorily complete all assignments and examinations.

BS-103 Human Biology

Catalog Description (including prerequisites)

Emphasis on human cell, tissue, and organ system function. Discussions focus on a systems approach to human health and disease. Does not count on any major or minor in Biology Department. Prerequisite: SW-110 or equivalent. (3)

Course Content

Although the emphasis of this course is on the physiological functions of human organ systems, effort will be made to show the interrelationship among biological, psychological and social functions of the human organism. Using a systems approach to frame the interaction among the various levels of human systems, from cellular to community, students will learn how changes at one level of a system influence changes at other levels. Biological principles of cell, tissue and organ systems will be reviewed in the context of how they may affect, or be affected by, psychological and social behavior. Examples will include demonstrating how biological communication via hormonal and nervous system signals initiates a stimulus-response cycle not limited to biological functions, but in tandem with psychological and social stimuli. Study of human diseases will allow students to explore how biological processes, interacting with psychological and social factors, contribute to human health and disease.

Nature of Course

Organ systems and their functions are presented by lecture, with supplementary web materials, and through group or individual learning activities. A portion of class periods will be devoted to the analysis of current events, as reported in various news media, within a biological context. Students are expected to participate in this analysis and share their findings within a small or large group setting.

Student Expectations

Exams will account for approximately 50% of the course grade. These exams will be a combination of objective and short answer questions. Participation in group and individual learning activities will determine the remaining 50% of the course grade.

BS-105 Environmental Biology***Catalog Description (including prerequisites)***

Discussion of biological principles with application to environmental issues. (3)

Course Content

Environmental Biology introduces students to basic biological principles in the context of pertinent environmental issues. These principles will primarily concern ecological topics such as energy flow, population growth, nutrient cycling, and the interactions between living organisms and their environment. In addition, the course will introduce students to the process of science, the concept of scientific authority, and the role of scientists in forming environmental policy. The impact of human activity on biological systems will be considered under the topics of: overpopulation and world hunger, energy and mineral resources, water resources and pollution, biological diversity, air pollution and atmospheric alterations, and wastes and hazardous chemicals.

Nature of Course

The course will consist of three 50-minute sessions per week. One time commitment outside of the regularly scheduled class period will be required. A mixture of teaching strategies will be employed, including lecture, discussion, videotapes, laboratory experiments, and field trips.

Student Expectations

Students are expected to attend and participate in all class activities including lectures, laboratory experiments, video summaries, small group discussion/debate, class presentations, field trips, examinations, and library investigation of an environmental issue. Student performance will be assessed on the basis of written assignments, examinations, and class participation.

BS-107 Investigations in Biology***Catalog Description (including prerequisites)***

Biological processes will be used to provide experience in scientific investigation and discussion of its implications and limitations. (3)

Course Content

A commonly held view is that science generally, and biology specifically, is merely a body of knowledge to be memorized. But this is mistaken. Science is more exciting. Science is a way of discovering and developing new knowledge.

We live in an age when the results, applications, and claims of science touch every corner of our daily lives. This is true from medicine to agriculture, to business, to electronics, to engineering, and to the environment. Much public debate, and many of our daily social and political decisions, require a general public that understands the methods, scope, and limitations of scientific research. Without such an understanding, we cannot evaluate scientific reports and debates in the media. Public misunderstanding of science may result in serious errors of judgment, with drastic personal, national, and global consequences.

Using the living systems theme, this course teaches science as a way of discovering, a way of developing new knowledge. It is designed for students with no experience in scientific research, but with an interest and willingness to learn. The course starts from an initial discussion of ways of knowing, and then develops in a step-by-step manner the skills of scientific research. By the end of the course, students will be conducting their own guided group research.

The living systems content will cover a range of biological themes and topics from among cell structure, simple food chemistry and diet, energy, the human heart and exercise, population ecology, photosynthesis and respiration, and plant development.

Nature of Course

Course format involves two two-hour laboratory periods per week. Teaching techniques emphasize small group and class discussions, group conduct of practical exercises and provide extensive opportunity for active student cooperation and learning.

Student Expectations

Complete all laboratory preparations, answering assigned questions throughout.

Participate in group and class discussion.

Perform all laboratory and out-of-class assigned exercises.

Design, conduct, and interpret the results of studies and research projects.

Perform and interpret statistical analysis of data.

Write research reports and abstracts.

Exams are open book and focus on the application of ideas developed in the course.

BS-108 Biology for Living

Catalog Description (including prerequisites)

To acquaint students with and help them to understand some of the fundamental biological processes and problems which confront living organisms. (3)

Course Content

This course is designed to present to the student some of the basic concepts, processes, and problems associated with living organisms. The intent is to develop in the student a sensitivity to the issues involved as well as the intellectual skills necessary for an understanding of these issues.

The course is divided into topic areas including the characteristics of life; energy demand and utilization within living systems, reproduction, heredity and change, and final topics to be selected by the class.

Nature of Course

Each topic area has a limited number of relevant outside readings in addition to the text material. There are also out-of-class assignments such as laboratory demonstrations and individual investigations with reports and/or class discussion of results.

In-class periods are devoted to introductory orientation lectures by the instructor. These are supplemented by small weekly discussion sections guided by an instructor.

Student Expectations

Attendance at all class meetings, participation in discussions and out-of-class activities, completion of written reports and assignments, and satisfactory performance on examinations.

BS-218 Biological Science: A Process Approach***Catalog Description (including prerequisites)***

This course applies scientific thought to structure, function, energetics, and ecology of living systems. Two one-hour lectures and one two-hour laboratory. Prerequisites: BS-118; PH-218. (3)

Course Content

This course introduces the elementary education majors to the scientific study of living systems. Students learn about historical and cultural influences on biological thought, how scientists use evidence to infer the evolution of life, how living things are interrelated in ecological systems, and how science as a human activity affects societal issues. Specific topics include organization of living systems, energetics, growth and development, reproduction, heredity, adaptation, and evolution.

Nature of Course

The format of the course is two one-hour lecture/discussion sessions and one two-hour laboratory session per week. Teaching strategies emphasize using science as a process for solving problems and answering questions. Consequently class emphasizes activities and laboratory/field investigations of biological phenomena.

Student Expectations

Attend all classes, participate in all class and laboratory activities, and satisfactorily complete all assignments and examinations.

FN-235 Nutrition for Health

Catalog Description (including prerequisites)

This course examines, analyzes, and evaluates the relationships between the science of nutrition, health, and well being. (3)

Course Content

This course is designed to provide a fundamental knowledge of the science of nutrition. The course provides the student with skills to critically evaluate the role of nutrition to health and to apply that knowledge to one's lifestyle. This study leads to an appreciation for the methods of scientific reasoning and research in understanding a living system.

Nature of Course

The teaching format will combine lecture and discussion styles in the classroom. Frequent activities will require critical thinking and application of knowledge in order to better equip the student to make informed food and lifestyle choices. Students will be asked to read the text and to locate and read relevant professional and popular articles which relate to the subject matter. Evidence of critical thinking and effective communication will be emphasized.

Student Expectations

A weekly activity will provide the student an opportunity to communicate knowledge and understanding of the subject. Four unit tests, including a final exam will be objective in nature. Each student will use computer technology to analyze their dietary intake. Reading and writing assignments require reading from current sources.