

BIOL 2017 Cell Biology (3,3,0) (E)

Prerequisite: BIOL 1005 Introduction to Biology

To provide a general understanding of cellular functions and the ultra structures of eukaryotic and prokaryotic cells. To introduce basic research tools used by cell biologists to increase the knowledge of structure and function of cells, and also to prepare students to undertake advanced biological studies.

BIOL 2025 Cell Biology Laboratory (1,0,3) (E)

To expose students to the basic research tools in cell biology. To enhance the understanding of the theories covered in the BIOL 2017 Cell Biology course.

BIOL 2026 Genetics (3,3,0) (E)

Prerequisite: BIOL 1005 Introduction to Biology

This course provides a general understanding of the structure, expression, regulation and mutation of genes. Various patterns and processes involved in the transmission of inheritable characteristics are introduced. Contributions of population genetics to the study of evolution, concepts of evolutionary genetics, and the recent hypothesis of molecular evolution are compared and discussed.

BIOL 2027 Genetics Laboratory (1,0,3) (E)

There are a series of experiments exposing students to basic tools and techniques used in the study of Genetics. Various organisms are used in the laboratory to enhance the understanding of genetic theories and principles.

BIOL 2035 Introduction to Environmental Sciences (3, 3, 0) (E)

Prerequisite: BIOL 1005 Introduction to Biology

This course aims to introduce to students the scientific principles and issues in environmental sciences. It is a combination of scientific evidence and technical appraisals of processes and problems in relation to environmental quality. The topics selected will demonstrate how environmental issues are related to our everyday life. By showing how environmental and resource problems are interrelated, students should be able to understand the concepts and apply the principles to solve environmental and resource problems.

BIOL 2036 Foundation of Bioanalysis (3,3,0) (E)

Prerequisites: BIOL 1005 Introduction to Biology

The course provides very strong foundation in the fundamental principles and theories for analysis of biological samples. Main emphasis will be focused on different biological aspects including cell biology, microbiology, biochemistry, molecular biology, physiology and immunology.

BIOL 2037 Foundation of Bioanalysis Laboratory (1,0,3) (E)

Prerequisite: SCIE 1005 Integrated Science Laboratory

Co-requisite: BIOL 2036 Foundation of Bioanalysis

The laboratory exercise provides a wide spectrum of bioanalytical techniques commonly used for the study of cell biology, microbiology, molecular biology, immunology and physiology. This course is designed to enhance, augment and reinforce the specific topics introduced during the lecture.

BIOL 2110 Ecology (3,3,0) (E)

Prerequisite: *For Biology students:* BIOL 1130 Biodiversity and BIOL 1310 Microbiology

For non-Biology students: Advanced Level Biology or SCI 1620 You and Your Environment

This course emphasizes biological functioning at the levels of population, community, and ecosystem, and is organized around the principles of energy flow and nutrient cycles. Human interventions such as urbanization, harvesting renewable and non-renewable resources, and pollution generation are considered in relation to natural limits, natural regulations and regeneration mechanisms, and long-term ecosystem stability.

BIOL 2120 Ecology Laboratory (1,0,3) (E)

Co-requisite: BIOL 2110 Ecology

This course aims to develop students' competence in modern methods of ecological research and environmental assessment, to utilize appropriate experimental techniques and to collect and interpret data. Ecological projects of local relevance will be emphasized.

BIOL 2160 Genetics and Evolution (3,3,0) (E)

Prerequisite: BIOL 1160 Biological Chemistry and BIOL 1210 Cell Biology

This course provides a general understanding of the structure, expression, regulation and mutation of genes. Various patterns and processes involved in the transmission of inheritable characteristics are introduced. Contributions of population genetics to the study of evolution, concepts of evolutionary genetics, and the recent hypothesis of molecular evolution are compared and discussed.

BIOL 2170 Genetics and Evolution Laboratory (1,0,3) (E)

Co-requisite: BIOL 2160 Genetics and Evolution

This laboratory exercise exposes students to basic tools and techniques used in the study of genetics. Various organisms are used in the laboratory to enhance the understanding of genetic theories and principles.

BIOL 2210 Animal Physiology (3,3,0) (E)

Prerequisite: BIOL 1130 Biodiversity and BIOL 1210 Cell Biology

This course aims to provide a fundamental knowledge on the basic principles and the interrelation between the anatomical and functional organization of animal body. Regulatory mechanisms that cause the functional systems to operate in homeostasis are discussed. Emphasis throughout is placed on the human physiology. Comparative physiology of lower animals is also introduced. Students will come to understand the major physiological systems involved in the maintenance of body functions.

BIOL 2220 Animal Physiology Laboratory (1,0,3) (E)

Co-requisite: BIOL 2210 Animal Physiology

This course (1) provides students with practical experience of applying important physiological concepts in animal physiology, (2) illustrates some basic but important physiological concepts by means of experiments, and (3) provides an opportunity to practise the methods and utilize the apparatus most frequently used in experimental physiology.

BIOL 2230 Plant Physiology (3,3,0) (E)

Prerequisite: BIOL 1130 Biodiversity and BIOL 1210 Cell Biology

This course deals with the plant physiological processes such as plant water relations, plant nutrition, photosynthesis, translocation, plant hormones and their roles during plant growth and development, plant morphogenesis and the control of flowering. Students are expected to use physiological principles to explain many plant performances, which are required in the applied aspects of plant sciences, such as horticulture and agronomy.

BIOL 2240 Plant Physiology Laboratory (1,0,3) (E)

Co-requisite: BIOL 2230 Plant Physiology

This laboratory exercise is designed to provide students with laboratory experience related to the materials covered in the lectures. Students will be exposed to basic techniques in investigating plant functions and data interpretation. Computer-based statistical analysis and graphical interpretation will be introduced.

BIOL 3005 Animal Physiology (3,3,0) (E)

Prerequisite: Biology major Year III/IV standing

This course aims to provide students with the fundamental knowledge on the basic principles and the interrelation between

the anatomical and functional organization of animal body. Regulatory mechanisms that cause the functional systems to operate in homeostasis are discussed. Throughout the course, emphasis is placed on human physiology. Comparative physiology of lower animals is also introduced. Students will come to understand the major physiological systems involved in the maintenance of body functions.

BIOL 3006 Animal Physiology Laboratory (1,0,3) (E)

Prerequisite: Biology major Year III/IV standing

This course provides students with practical experience of applying important physiological concepts in Animal Physiology. Some basic but important physiological concepts are illustrated by means of experiments. It also provides an opportunity for students to practise the methods and utilize the apparatus most frequently used in experimental physiology.

BIOL 3007 Ecology (3,3,0) (E)

Prerequisite: Biology major Year III/IV standing

This course places emphasis on biological functioning at the levels of population, community, and ecosystem, and is organized around the principles of energy flow and nutrient cycles. Human interventions such as urbanization, harvesting renewable and non-renewable resources, and pollution generation are considered in relation to natural limits, natural regulations and regeneration mechanisms, and long-term ecosystem stability.

BIOL 3015 Ecology Laboratory (1,0,3) (E)

Prerequisite: Biology major Year III/IV standing

This course aims to use local ecological topics to facilitate the students' learning of modern methods of ecological research and environmental assessment, utilization of appropriate experimental techniques, collecting and interpreting data, and writing of ecological reports.

BIOL 3016 Environmental Health and Toxicology (3,3,0) (E)

Prerequisite: Biology major Year III/IV standing

The course provides the general knowledge on the various routes of human exposure to toxic chemicals. Main emphasis will be placed on the biological responses to toxicants, methods for evaluating potential toxicity and applications of toxicological data to assess potential health risk.

BIOL 3017 Molecular Biology (3,3,0) (E)

Prerequisite: Biology major Year III/IV standing

This course aims to provide a solid foundation in describing the molecular and cellular mechanisms in the maintenance and the regulation of the expression of the genome. Special attention will be given to the organization of eukaryotic genes, the flow of genetic information and the control of gene expression.

BIOL 3025 Plant Physiology (3,3,0) (E)

Prerequisite: Biology major Year III/IV standing

This course deals with plant physiological processes such as plant-water relations, plant-environment interactions, mineral nutrition, carbon and nitrogen metabolism, and plant growth and development. Students are expected to use physiological principles to explain how plants control their growth and development under natural and agricultural environments.

BIOL 3026 Plant Physiology Laboratory (1,0,3) (E)

Prerequisite: Biology major Year III/IV standing

This laboratory session is designed to provide students with laboratory experience related to the materials covered in the lectures. Students will be exposed to basic techniques in investigating plant functions and data interpretation. Computer-based statistical analysis and graphical interpretation will be introduced.

BIOL 3027 Waste Treatment and Recycling (3,3,0) (E)

Prerequisite: Biology major Year III/IV standing

(1) Understand the origins of waste and the social, political and economic issues involved with waste disposal; (2) review the waste generation problem and to examine various physical, chemical and biological waste treatment methods; (3) introduce various technologies in reducing and reutilizing the various types of wastes; and (4) acquire a comprehensive knowledge of current and anticipated legislation regarding waste and their potential implications.

BIOL 3035 Immunology (3,3,0) (E)

Prerequisite: Biology major Year III/IV standing

This course is to provide basic concepts in the rapidly advancing field of Immunology, and to expose students to modern and current applications of Immunology in Cell Biology, Molecular Biology and Medical Sciences.

BIOL 3036 Neurobiology (3,3,0) (E)

Prerequisite: Biology major Year III/IV standing

The course studies neurobiology with main emphasis on how neuronal information is integrated in the CNS to control bodily functions such as visual recognition, sleep, memory and movement. The course also studies the autonomic nervous system with an emphasis on its control of body functions. Lastly, the relationship between the nervous system and the hormonal system will also be stressed.

BIOL 3037 Plant Propagation and Breeding (3,3,0) (E)

Prerequisite: Biology major Year III/IV standing

This course is divided into two main sections, plant propagation and plant breeding. Students are expected to understand the principles involved in the practices of the two important aspects of applied plant sciences. Both conventional and modern methods, and technology are introduced with emphasis on the micropropagation and conventional hybridization breeding of plant.

BIOL 3140 Environmental Health and Toxicology (3,3,0) (E)

Prerequisite: BIOL 1160 Biological Chemistry and BIOL 2210 Animal Physiology

This course provides general knowledge concerning the various routes of human exposure to toxic chemicals. Main emphasis will be placed on the biological responses to toxicants, methods for evaluating potential toxicity and applications of toxicological data to assess potential health risk.

BIOL 3150 Principles of Environmental Management (3,3,0) (E)

Prerequisite: BIOL 2110 Ecology or Geography major Year III standing

This course discusses the anthropogenic causes of environmental degradation and the way sustainable growth can be brought about by environmental management. This course also examines the framework of environmental planning and management and the techniques for tackling environmental management. This course then applies principles of environmental science to help manage some of the diverse array of environmental problems, in different physical, biological and social environment.

BIOL 3160 Molecular Biology (3,3,0) (E)

Prerequisite: BIOL 1160 Biological Chemistry, BIOL 1210 Cell Biology, BIOL 1310 Microbiology and BIOL 2160 Genetics and Evolution

This course aims to provide a fundamental principle and current techniques in molecular biology with particular regard to topics related to application in biotechnology. Special attention will be given to the organization of eukaryotic genes, the flow of genetic information and the control of gene expression. The recombinant DNA technology in protein engineering will be emphasized.