

<b>3 CH</b>	Prereq:	Concurrent 0201107
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<b>0201101</b>	<b>General Biology (1)</b>	<b>3</b>	<b>0</b>
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General Biology (1) is an introductory course which covers the basics of cell biology in a traditional order, from the structure and function of molecules to the structure and organization of cells. As part of cell organization, this course also introduces metabolism and genetics, thus preparing students for General Biology (2) and other, upper-level courses in the natural and health sciences.

<b>3 CH</b>	Prereq:	0201101
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<b>0201102</b>	<b>General Biology (2)</b>	<b>3</b>	<b>0</b>
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This theoretical course is offered to freshman students of natural sciences. It introduces commonly used terminology in animal biology and the concepts of body organization and homeostasis in animals. The course addresses the main tissue types and the structure and function of most of the human and animal's organs and organ systems.

<b>1 CH</b>	Prereq:	Concurrent 0201101
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<b>0201107</b>	<b>General Biology lab</b>	<b>0</b>	<b>3</b>
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General Biology Lab (1) is an introductory course providing training in the basic laboratory methodology used in the study of biological systems. As in other biology lab courses, this course encourages students to participate in the process of science and develop creative and critical reasoning skills. This course includes microscopic activities and different tests for biological macromolecules. It also introduces the analysis of enzyme activity, photosynthesis, cellular respiration, cell division and the basics of inheritance.

<b>2 CH</b>	Prereq:	0201102
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<b>0201211</b>	<b>Invertebrates</b>	<b>2</b>	<b>0</b>
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This course focuses on functional and evolutionary morphology of the invertebrates. It includes structure, function, life cycles, diversity, development and special adaptations in major invertebrate taxa.

<b>1 CH</b>	Prereq:	Concurrent 0201211
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<b>0201212</b>	<b>Invertebrates lab</b>	<b>0</b>	<b>3</b>
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This lab is associated with the Invertebrates theoretical course and deals with the features of major taxonomic groups and the comparative morphology and anatomy of invertebrates. Students will investigate slides using light and dissecting microscopes, study models and carry out dissections of selected invertebrates. Field trips to terrestrial, freshwater and marine habitats (Aqaba) will enable students to observe invertebrates in their natural environment and collect some samples.

<b>2 CH</b>	Prereq:	0201211+
		Concurrent
		0201215

<b>0201214</b>	<b>Entomology</b>	<b>2</b>	<b>0</b>
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This course covers fundamental aspects of insect biology and includes evolution, morphology, development and life cycles, and ecology of insects. In addition, the course introduces the major insect orders and addresses their medical, ecological and agricultural importance.

<b>1 CH</b>	Prereq:	Concurrent
		0201214

<b>0201215</b>	<b>Entomology Lab</b>	<b>0</b>	<b>3</b>
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This is the laboratory component of the Entomology theoretical course and allows students to investigate morphology and anatomy of insects using light and dissecting microscopes. Students acquire skills in insect collection, identification and preparation and the lab course also includes field work.

<b>3 CH</b>	Prereq:	0201102
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<b>0201221</b>	<b>Plant Biology</b>	<b>3</b>	<b>0</b>
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This course introduces anatomy, function, reproduction and development of vascular and non-vascular plants ranging from algae to angiosperms.

<b>1 CH</b>	Prereq:	Concurrent
		0201221

<b>0201222</b>	<b>Plant Biology Lab</b>	<b>0</b>	<b>3</b>
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This is the laboratory component of the introductory Plant Biology course. Students become acquainted with the various taxonomic groups and their features and investigate tissues and organs of plants using live models and (self) prepared slides.

<b>2 CH</b>	Prereq:	0201221 +
		Concurrent
		0201224

<b>0201223</b>	<b>Plant Taxonomy</b>	<b>2</b>	<b>0</b>
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This course is a study of vascular plants with emphasis on flowering, fruiting and morphology, and the use of these features in classification, identification and nomenclature. Medicinal and economic importance of plants and ecological relationships will also be addressed.

<b>1 CH</b>	Prereq:	Concurrent 0201223
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<b>0201224</b>	<b>Plant Taxonomy Lab</b>	<b>0</b>	<b>3</b>
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This lab is part of the Plant Taxonomy course. It will facilitate the learning process of the theoretical part, and students will acquire the skills of identification using suitable keys and the preparation of a herbarium. This lab includes field trips in which the student can collect plants for later identification and relate distribution to environmental factors.

<b>2 CH</b>	Prereq:	0201102
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<b>0201231</b>	<b>Histology and Micro-techniques</b>	<b>2</b>	<b>0</b>
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In this course, students will compare the cells and tissues among the various organs of vertebrate animals. Histology will be presented as integral part and in relation to animal and human physiology, biochemistry and molecular biology.

<b>1 CH</b>	Prereq:	Concurrent 0201231
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<b>0201232</b>	<b>Histology and Micro-techniques lab</b>	<b>0</b>	<b>3</b>
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This practical course introduces the applications of different types of microscopic preparations. It also includes techniques associated with preparation and analysis of animal tissues for light microscopic studies including whole mounts, smears, squashes and sectioning.

<b>3 CH</b>	Prereq:	0201101
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<b>0201251</b>	<b>Cell Biology</b>	<b>3</b>	<b>0</b>
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This theoretical course focuses on the molecular and ultra structure and function of cells. It includes cellular transport, sorting, and compartmentalization, signaling, motility, cell division and cellular aspects of cancer.

<b>3 CH</b>	Prereq:	0201101
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<b>0201252</b>	<b>Genetics</b>	<b>3</b>	<b>0</b>
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This course covers a broad area ranging from classical Mendelian genetics to the basic principles, applications and ethics of genetic engineering. It also introduces population genetics which is basic to the understanding of evolutionary biology.

<b>1 CH</b>	Prereq:	Concurrent 0201252
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<b>0201253</b>	<b>Genetics lab</b>	<b>0</b>	<b>3</b>
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This is the laboratory component for the Genetics course and aims at familiarizing students with karyotyping, model organisms such as fruit flies and their use in genetic lab investigations. The

course also introduces basic data analysis techniques including pedigrees and comparing frequencies using the chi-square test.

<b>0201311</b>	<b>Vertebrate Biology</b>	<b>2 CH</b>	<b>Prereq:</b> 0201211
		<b>2</b>	<b>0</b>

The course covers principles of functional and evolutionary vertebrate morphology. Students study the features and derived characters of vertebrate clades, phylogenetic relationships and relate anatomy to its function/biological role.

<b>0201312</b>	<b>Vertebrate Biology lab</b>	<b>1 CH</b>	<b>Prereq:</b> Concurrent 0201311
		<b>0</b>	<b>3</b>

This is the laboratory component for the theoretical course which focuses on functional and evolutionary morphology of vertebrates. It includes studying of models, trapping and identifying small vertebrates, dissection of amphibians, mammals and birds and preparing skeletons of small vertebrates. The lab will also include a few field visits to areas surrounding the campus.

<b>0201314</b>	<b>Parasitology</b>	<b>3 CH</b>	<b>Prereq:</b> 0201211
		<b>2</b>	<b>2</b>

This course aims at introducing the different types and evolution of host-parasite interactions, life cycles – infection and transmission including the roles of vectors and intermediate hosts. The course also deals with important parasites which infect humans and cause disease, and how these can be controlled. The morphology, distribution and identification of these parasites will be introduced in the class and during a number of practical sessions.

<b>0201317</b>	<b>Evolution</b>	<b>3 CH</b>	<b>Prereq:</b> 0201252
		<b>3</b>	<b>0</b>

This course enables students to investigate the evidence of biological evolution and study the different mechanisms of evolution, such as natural selection and gene drift. Evolutionary biology is presented as a dynamic product of constant research efforts and demonstrates the relevance of evolution to all of modern biology and to practical real-world problems.

<b>0201321</b>	<b>Plant Physiology</b>	<b>3 CH</b>	<b>Prereq:</b> 0201221
		<b>3</b>	<b>0</b>

This course covers in more detail the processes of photosynthesis, metabolism, growth and reproduction which occur in flowering plants. The adaptations that allow plants to survive in and respond to their physical environment including water and nutrient availability will be discussed.

<b>1 CH</b>	Prereq:	Concurrent 0201321
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<b>0201322</b>	<b>Plant Physiology Lab</b>	<b>0</b>	<b>3</b>
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This is the laboratory component for the theoretical course. Students study relationships of plants to water, nutrients and light and design experiments in the lab and greenhouse to analyze the impacts of various factors on germination, growth and general plant performance.

<b>2 CH</b>	Prereq:	0201221
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<b>0201323</b>	<b>Applied Plant Biology</b>	<b>2</b>	<b>0</b>
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This course supplements previously acquired information in the plant biology, taxonomy and physiology courses. It integrates this knowledge into widely used applications and includes a range of themes, namely economic and medicinal plants, sustainable and organic agriculture, crop improvement and plant biotechnology, forestry and rangeland management.

<b>3 CH</b>	Prereq:	0201251 0201251
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<b>0201331</b>	<b>Microbiology</b>	<b>3</b>	<b>0</b>
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This course is a study of the biology and classification of microorganisms, with a focus on prokaryotes. The course addresses the effects of chemical and physical agents on the growth of bacteria. It introduces the health problems caused by certain microorganisms and their numerous benefits e.g. in biotechnology and bioremediation, and their fundamental role in ecosystems.

<b>1 CH</b>	Prereq:	Concurrent 0201331
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<b>0201332</b>	<b>Microbiology Lab</b>	<b>0</b>	<b>3</b>
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Practical sessions will cover culturing of microorganisms from natural samples, isolation, identification, classification and staining techniques. Students experience preparation of microbiological culture media, sterilization and antiseptic techniques and an antibiotic sensitivity test. Students design experiments to study the impacts of physical and chemical factors on selected microorganisms.

<b>3 CH</b>	Prereq:	0201102
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<b>0201333</b>	<b>Immunology</b>	<b>3</b>	<b>0</b>
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Introduction to the basic concepts of immunology, antigens, antibody structure, types and function, and the cells and organs involved in an immune response. The course covers both integrated and adaptive immune responses in vertebrates. The course also demonstrates some of the immune diseases such as hypersensitivity, autoimmunity and transplantation problems. Lab techniques will be discussed and demonstrated to the students, including production and isolation of antibodies, ELISA, and Immunoblotting.

		<b>3 CH</b>	Prereq:	0201231
<b>0201334</b>	<b>Hematology</b>	<b>3</b>	<b>0</b>	

This course introduces the composition of blood, development and function of blood cells and other blood components. The structure and function of the red blood corpuscle and hemoglobin will be studied as are the types of disease which arise from their malfunction. Standard laboratory techniques will be demonstrated to the students.

		<b>3 CH</b>	Prereq:	0902111
<b>0201341</b>	<b>Biochemistry</b>	<b>3</b>	<b>0</b>	

The biochemistry course focuses on the structure and function of biological macromolecules as well as metabolic pathways and enzyme function.

		<b>1 CH</b>	Prereq:	Concurrent 0201341
<b>0201342</b>	<b>Biochemistry Lab</b>	<b>0</b>	<b>3</b>	

This introduction to biochemical techniques includes acid-base titrations, separation and isolation of biological molecules, spectrophotometric measurements, analysis of enzyme activity, electrophoretic techniques and some immunological techniques.

		<b>2 CH</b>	Prereq:	0201102
<b>0201362</b>	<b>Basic Biotechnology</b>	<b>2</b>	<b>0</b>	

This class introduces biotechnology and its importance in solving real-world problems. It provides an overview over the various uses of biological systems, including the use of micro-organisms and recombinant DNA in agriculture, industry, bioremediation, and medicine. Ethical issues in biotechnology are also covered in this course.

		<b>2 CH</b>	Prereq:	0201211
<b>0201411</b>	<b>Developmental Biology</b>	<b>2</b>	<b>0</b>	

Developmental Biology provides an overview of the major features of early embryonic development in animals. This course focuses on studying the developmental stages and how genes control development in different organisms ranging from fruit flies to humans. Current approaches in developmental biology including genetic engineering, stem cell research and molecular biology and the importance of developmental biology to human society are parts of the course as well.

		<b>1 CH</b>	Prereq:	Concurrent 0201411
<b>0201412</b>	<b>Developmental Biology Lab</b>	<b>0</b>	<b>3</b>	

This is the laboratory component for the theoretical course (201411). It familiarizes students with widely used model organisms and microscopic and other techniques used to observe and analyze developmental stages in the lab.

<b>2 CH</b>	<b>Prereq:</b> 0201311
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<b>0201413</b>	<b>Animal Physiology</b>	<b>2</b>	<b>0</b>
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This course covers animal function and adaptations/means of surviving and maintaining homeostasis in various environments. Main themes include hematology, osmo-regulation and electrolyte balance, excretion, respiration, circulation, metabolism, thermoregulation, neuro-endocrine control, and physiological rhythms. Reproductive physiology and its hormonal control are introduced.

<b>1 CH</b>	<b>Prereq:</b> Concurrent 0201413
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<b>0201414</b>	<b>Animal Physiology Lab</b>	<b>0</b>	<b>3</b>
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This is the laboratory component for the theoretical course. It introduces various techniques in the study and analysis of animal organs and organ systems, e.g. how to measure neural and muscular activity, respiratory and circulatory performance, renal performance, basal metabolic rate, the effects of metabolite and hormone concentrations, and others. In addition to the use of live models in the lab, some lab sessions will include dry labs and simulations.

<b>3 CH</b>	<b>Prereq:</b> 0201221+ 0201311
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<b>0201415</b>	<b>Ecology</b>	<b>3</b>	<b>0</b>
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The course introduces ecology as an inter-disciplinary science of current significance. The course covers the fundamental relationships of living organisms with their environment and the concepts of natural selection, adaptation and distribution. The structure and dynamics of populations and communities, and ecosystem function will be introduced and related to various applications and environmental issues which affect biodiversity and human-well being.

<b>1 CH</b>	<b>Prereq:</b> Concurrent 0201415
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<b>0201416</b>	<b>Ecology Lab</b>	<b>0</b>	<b>3</b>
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This is the laboratory component for the Ecology course. The course includes field trips to a variety of sites, where students can observe organisms in their natural environment. Students will become familiar with measurements of the physical environment and density estimations during field sessions. The lab course also enables students to design experiments to study ecological relationships.

<b>3 CH</b>	<b>Prereq:</b> 0201415
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<b>0201417</b>	<b>Applied Ecology</b>	<b>3</b>	<b>0</b>
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This elective course is designed to allow discussions about the integration of ecological knowledge into widely used applications, e.g. biological control, sustained yield, conservation medicine, and principles of conservation biology which includes biodiversity conservation and ecosystem restoration.

<b>2 CH</b>	Prereq:	0201311 + Concurrent 0201419
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<b>0201418</b>	<b>Animal Behavior</b>	<b>2</b>	<b>0</b>
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The course focuses on the four questions about behavior: causation, development, evolution and function. Students in this course can use an evolutionary perspective to ask what features of an animal's behavior allow it to survive and reproduce, i.e. why is behavior adaptive?

<b>1 CH</b>	Prereq:	Concurrent 0201418
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<b>0201419</b>	<b>Animal Behavior Lab</b>	<b>0</b>	<b>3</b>
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This is the laboratory component for the Animal Behavior course. During this course, students observe, design experiments, describe and quantify behavior in the lab and field.

<b>3 CH</b>	Prereq:	0201252
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<b>0201441</b>	<b>Molecular Biology</b>	<b>3</b>	<b>0</b>
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This course details the molecular structure of nucleic acids, as well as replication, transcription and translation of the genetic material. Gene activation and its function will be discussed in detail. This course complements other courses (Genetics, Biotechnology) in providing undergraduate students with a broad proficiency in the methods and applications of genetic engineering and the importance of molecular biology in human health and medicine.

<b>1 CH</b>	Prereq:	Concurrent 0201441
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<b>0201442</b>	<b>Molecular Biology Lab</b>	<b>0</b>	<b>3</b>
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The lab is designed to allow the student to master several biochemical techniques commonly used in a molecular biology lab i.e., quantitative protein and DNA assays, gel electrophoresis of DNA, PCR, cloning, and some immunological techniques.

<b>3 CH</b>	Prereq:	0201441
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<b>0201443</b>	<b>Bioinformatics</b>	<b>3</b>	<b>0</b>
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This course introduces students to some of the most commonly used software packages for genetic analysis of nucleic acid, protein sequences and designing primers for PCR. In addition the class explores and explains some of the computational biology tools found on the Internet and how they can be applied to problems in genomic and molecular biology. The course includes lectures and exercises in the computer lab.

		<b>2 CH</b>	Prereq: 0201341
<b>0201451</b>	<b>Molecular Cell Biology</b>	<b>2</b>	<b>0</b>

This course focuses on two important topics within the domain of molecular cell biology, namely 1) the molecular basis of cell signaling and signal transduction and 2) the control of gene expression.

		<b>1 CH</b>	Prereq: 0201102
<b>0201471</b>	<b>Seminar</b>	<b>2</b>	<b>0</b>

An in-depth study of biologically oriented topics including applications in biotechnology in an area not usually covered by scheduled courses. Emphasis is on current literature with independent literature research and presentations.

		<b>3 CH</b>	Prereq: 0201102
<b>0201472</b>	<b>Selected Topics in Biology/ Biotechnology</b>	<b>3</b>	<b>0</b>

This course includes special topics in Biology or Biotechnology that warrant an extensive coverage in a separate course not typically offered by the department.

		<b>3 CH</b>	Prereq: 0201102
<b>0201473</b>	<b>Research Project</b>	<b>3</b>	<b>0</b>

This project is elective and includes a well-defined problem to be assigned to the student to carry out experimental or observational work and to present it in an acceptable form as a scientific report.