

# Department of Biology

Chairperson:	Smith, Colin A.
Professors:	Baydoun, Elias H.; Darwiche, Nadine D.; Gali-Muhtasib, Hala U.; Knio, Khuzama M.; Kreydiyyeh, Sawzan I.; Talhouk, Rabih S.
Associate Professors:	Bariche, Michel J.; Saoud, Imad P.; Smith, Colin A.
Assistant Professors:	Ghanem, Noel D.; Jaalouk, Diana E.; Osta, Mike A.; Sadek, Riyad A.
Lecturers:	Rizkallah, Hind D.; Sinno-Saoud, Nada; Tarraf, Charbel G.
Instructor:	Hajjar, Layane A.M.

## Undergraduate Program

### BS in Biology

#### Mission Statement

The BS program in Biology prepares students for advanced study and careers in research, education, and service in Biology-related disciplines. Students will acquire descriptive, experimental, quantitative, and conceptual abilities spanning molecular, cellular, organismal, and ecological levels. Lecture and laboratory courses will emphasize model systems, the role of evolution, the diversity of living systems, hypothesis-based reasoning, and communication skills. Science, social science, and humanities coursework will foster creativity, free thought, interdisciplinary skills, and commitment to ethical scholarship.

#### Requirements

All students admitted as sophomores are eligible to continue in the program provided they obtain, by the end of their third regular semester at AUB, a minimum average of 70 in their biology courses. Transfer to biology from other departments within the Faculty of Arts and Sciences requires departmental approval. Students can transfer to Biology provided they obtain a minimum grade of 70 in BIOL 201 and 70 in BIOL 202 and a passing grade in CHEM 201 by the end of their third regular semester at AUB.

The requirements for a BS degree in Biology are 90 credits for students entering the department at the sophomore level. The distribution of these course is as follows:

**University Language Requirements:** 6 credits in English and 3 credits in Arabic.

**University General Education Requirement:** 12 credits in the humanities including six credits of CVSP. 6 credits in the Social Sciences. (37+15) credits in the Natural Sciences, 3 credits in Quantitative Thought; Stat 210.



- BIOL 200**            **Diversity of Life**            **3.3; 4 cr.**  
A course that deals with the basic aspects of cell structure and function, heredity, diversity, classification, evolution and interrelationships of living things, and briefly covers organs and systems in animals and plants. Laboratory activity reflects the contents of the course. Not open to biology majors. *Sophomore standing is required. Each semester.*
- BIOL 201**            **General Biology I**            **3.3; 4 cr.**  
An integrated approach to the biology of organisms covering the organization of life, energy transfer through living systems, perpetuation of life, and diversity of life. *Each semester.*
- BIOL 202**            **General Biology II**            **3.3; 4 cr.**  
A study of the anatomy and physiology of plants and animals covering their structure, growth, nutrition, transport, reproduction, development, and control systems. This course focuses also on the relationships between structure and function, and stresses the evolutionary adaptation and changes in the different systems of the major plant and animal groups. *Prerequisite: BIOL 201. Each semester.*
- BIOL 210**            **Human Biology**            **3.0; 3 cr.**  
A course that covers the fundamental principles of cell biology, genetics, and human biology, with emphasis on the morphology, physiology, and disorder of body systems. *Not open to biology majors. Students cannot receive credit for all three of the following: BIOL 201, BIOL 202, BIOL 210. Each semester.*
- BIOL 220**            **Introductory Biochemistry**            **3.0; 3 cr.**  
An introduction to the structure-function relationships of biomolecules, cells, enzymes, and the metabolic reactions of living cells. *Prerequisite: BIOL 202; Pre- or co-requisite: CHEM 211. Each semester.*
- BIOL 223**            **Genetics**            **3.3; 4 cr.**  
A course that deals with the basic principles of classical and modern genetics with emphasis on the analysis of genetic material and genetic processes at the molecular level. *Prerequisite: BIOL 202. Each semester.*
- BIOL 224**            **Microbiology**            **3.3; 4 cr.**  
A course that deals with micro-organisms, especially bacteria, and in particular those of pathogenic and industrial importance. Basic knowledge on isolation, classification, and the various metabolic processes is included in this course. *Prerequisite: BIOL 223. Each semester.*
- BIOL 225**            **Molecular Biology**            **3.0; 3 cr.**  
A course that introduces the different techniques of molecular biology and recombinant DNA technology, and discusses the most recent advances in the field. *Prerequisite: BIOL 223. Occasionally.*
- BIOL 230**            **Plant Morphology**            **3.3, 4 cr.**  
A study of the form and structure of the different plant divisions on the basis of similarity of plan and origin. Both reproductive and non-reproductive organs are studied. *Prerequisite: BIOL 202. Occasionally.*
- BIOL 233**            **Non-Vascular Autotrophs and Fungi**            **2.3; 3 cr.**  
A survey of the biology and classification of bacteria, algae, bryophytes, lichens, and fungi. Life cycles, anatomy, morphology, physiology, and ecology of each group are covered, and their role in diseases and production of food and antibiotics is emphasized. *Prerequisite: BIOL 202. Occasionally.*
- BIOL 234**            **Vascular Plants**            **2.3; 3 cr.**  
A course that deals with the structure, life history, and classification of vascular plants, including psilophytes, club mosses, horsetails, ferns, conifers, and flowering plants, emphasizing their evolutionary relationships. *Prerequisite: BIOL 202. Occasionally.*

- BIOL 235 Plant Anatomy 2.3; 3 cr.**  
A course that deals with the structure and function of tissues and organs of higher plants, their origin, and differentiation. *Prerequisite: BIOL 202. Occasionally.*
- BIOL 236 Plant Systematics 2.3; 3 cr.**  
A course that deals with the relationships between and among vascular plants based on evolutionary principles as expressed by systematics. The underlying principles of systematics, including modern molecular technological approaches are provided. Students deal with plant identification, and classification of the major families of local vascular plants. *Prerequisite: BIOL 202. Occasionally.*
- BIOL 240 Animal Behavior 3.0; 3 cr.**  
A course that covers the basic concepts of animal behavior including physiological, genetic, ecological, and evolutionary aspects, as well as exploration of the controversial ideas of sociobiology. *Prerequisite: BIOL 202. Occasionally.*
- BIOL 241 Biology of Invertebrates 3.3; 4 cr.**  
A study of invertebrates, excluding insects, emphasizing their morphological and functional diversity, phylogenetic relationships, classification, development, and adaptation. *Prerequisite: BIOL 202. Annually.*
- BIOL 242 Comparative Vertebrate Anatomy 3.3; 4 cr.**  
A comparative study of the structure and function of selected examples of chordate animals with a presentation of the history of structural organization and association of structural changes with functional adaptations. *Prerequisite: BIOL 202. Occasionally.*
- BIOL 243 Behavioral Neuroscience 3.0; 3 cr.**  
An introduction to the neural basis of behavior. The course surveys the structure and organization of the human brain and how complex behavior arises from it. *Prerequisite: PSYC 102 or 202. Annually.*
- BIOL 244 Introduction to Neurobiology 3.0; 3 cr.**  
A foundation course that introduces students to the functions of the nervous system. Broad and comparative in approach. This course covers material from the molecular to higher organizational levels of neural functions. *Prerequisite: BIOL 202. Annually.*
- BIOL 245 Environmental Physiology of Aquatic Organisms 3.0; 3 cr.**  
A course that describes the strategies used by aquatic animals to deal with environmental variations. Various animal physiological systems are covered with an emphasis on aquatic adaptations. Some topics such as air bladder control, electrical generation and reception, and gill excretion are specific to aquatic organisms and are introduced herein. *Prerequisites: BIOL 200 or BIOL 202. Annually.*
- BIOL 246 Marine Biology 3.3; 4 cr.**  
A course that introduces the biology of life in the marine environment (microbial world, seaweeds and plants, marine animals) as well as the structure and function of the marine ecosystem (e.g., coral reefs, the ocean depths, estuaries). The impact of humans on the marine environment is also covered. *Prerequisite: BIOL 202. Each semester.*
- BIOL 247 Animal Physiology 3.0; 3 cr.**  
A study of the fundamental principles and mechanisms that govern body functions in animals, with an emphasis on the molecular aspects. *Prerequisites: BIOL 202 and senior standing. Annually.*
- BIOL 249 Parasitology 3.3; 4 cr.**  
A general overview on the classification, morphology, development, and physiology of human and animal parasites. *Prerequisite: BIOL 202. Annually.*





- BIOL 281 Ichthyology 3.0; 3 cr.**  
A study of the different types of fish, their natural history, and environmental and ecological adaptations. It also deals with methods of conserving and culturing fish of economic value, as well as the effect of pollution on fish fauna. *Prerequisite: BIOL 202. Annually.*
- BIOL 283 Reproductive Physiology 3.0; 3 cr.**  
An examination of the mechanisms of all major aspects of male and female mammalian reproductive physiology. Emphasis is also given to species variation with regard to reproductive function and to a detailed examination of key reproductive events in both sexes. *Prerequisite: BIOL 202. Annually.*
- BIOL 284 Developmental Biology 3.3; 4 cr.**  
A study of basic mechanisms, molecular basis, and environmental factors that control embryonic development in both plants and animals, with special emphasis on vertebrate animal systems. *Prerequisite: BIOL 202. Occasionally.*
- BIOL 286 Entomology 3.3; 4 cr.**  
An introduction to the study of insects, their diversity, classification, morphology, biology, behavior; and their medical, ecological, and agricultural importance. *Prerequisite: BIOL 202. Annually.*
- BIOL 290 Special Topics in Biology 1, 2, 3, or 4 cr.**  
Topics in biology that warrant an extensive coverage in a separate course not typically offered by the department. *May be repeated for credit. Each semester.*
- BIOL 291/292 Undergraduate Tutorial 2 or 3 cr.**  
*Prerequisites: senior standing, a minimum average of 80 in the major, and consent of instructor. Each semester.*
- BIOL 293/294 Undergraduate Seminar 1 cr.**  
*Credit cannot be obtained for both 293 and 294. Prerequisite: senior standing. Each semester.*

## 37 Credits in Biology<sup>1</sup>

Modes of Analysis	English and Arabic (9)	Humanities (12)	Social Sciences (6)	Natural Sciences (37+15) <sup>2</sup>	Quantitative Thought (3)
Lecture courses (9+12+6+30+12+3)	1. Required Arabic course: 201A or B, or any upper level course (3) 2. Required English courses: 203(3), 204(3)	1. Required credits in the humanities: 12 credits including 6 credits from CVSP	Required (6)	1. Required biology <sup>3</sup> (18): BIOL 201(4), 202(4), 223(4), 220(3), and two from the following four courses: 224(4), 260(4), 270(4), 252(4) 2. Elective biology (12+1 lab): a total of 13 credits, including a minimum of one 4-credit course 3. Required chemistry (9): CHEM 201(3), 211(3), 212(3) 4. Required physics (3): PHYS 204(3) or PHYS 205(3)	Required mathematics (3): STAT 210 (3)
Seminar (1)				Required: BIOL 293/4(1)	
Laboratory (5+1+2+1)				1. Required biology <sup>3</sup> (5): BIOL 201(4), 202(4), 223(4), and two from the following four courses: BIOL 224(4), BIOL 252(4), 260(4), 270(4) 2. Elective biology <sup>3</sup> (1): minimum of one 4-credit course 3. Required chemistry (2): CHEM 210(2) 4. Required physics (1): PHYS 204L(1) or PHYS 205(1)	
Research Project (0, 2, or 3)				Elective biology courses (2–3): BIOL 291/2(2 or 3)	

<sup>1</sup> Plus 8 free elective credits

<sup>2</sup> At least 37 credits in biology, and 15 credits in the sciences

<sup>3</sup> These courses include 1-credit laboratory component and have been listed both under lecture and laboratory courses.