

**Dr. Noël Ghanem**

**BIOL201**

**General Biology I -4 credits-**

**Course description**

The course is a general introduction course to the fundamental principles of cellular biology, molecular biology, reproductive biology, genetics and evolution. It covers several biological concepts related to the above disciplines and provides an overview of the cell structure, energy and metabolism inside the cell, photosynthesis, cell communication and cell division. The structure and function of the chemical buildings of life including the relationship between nucleic acids and proteins is emphasized as well as how these molecules are synthesized and integrated into multicellular systems. Topics also covered include: the nature of science, the origin of life and the theory of evolution, the classification of organisms and the main characteristics of the three domains of life.

**Textbook and Resources:**

- 1) Raven 2011, Biology, 9th edition
- 2) Material for the course is available on Moodle
- 3) McGraw-Hill Higher Education website:  
<http://highered.mcgraw-hill.com/classware/selfstudy.do?isbn=0072965819>

**Course syllabus**

**Unit 1**

- Chapter 1: The science of Biology
- Chapter 3: The chemical buildings of life
- Chapter 4: Cell structure
- Chapter 5: Membranes

**Unit 2**

- Chapter 6: Energy and metabolism
- Chapter 7: How cells harvest energy
- Chapter 8: Photosynthesis
- Chapter 9: Cell communication

**Unit 3**

- Chapter 10: How cells divide
- Chapter 11: Sexual reproduction and meiosis
- Chapter 12: Patterns of inheritance
- Chapter 13: Chromosomes, mapping and the meiosis-inheritance connection

**Unit 4**

- Chapter 14: DNA: the genetic material
- Chapter 15: Genes and how they work

**Unit 5**

- Chapters 23 and 26: The Tree of life
- Chapter 27: Viruses
- Chapter 28: Prokaryotes
- Protists, Fungi and the animal kingdom (Invertebrates) will be covered in the laboratory

## **Learning outcomes**

The students will be able to:

1. understand the role of biology and the relevance of different biological processes to our daily life
2. use the microscope and learn the basic skills of light microscopy
3. describe the structure of the cell and learn the function of its different components
4. compare a prokaryotic and a eukaryotic cell and highlight their differences
5. learn the basic concepts in cell metabolism and photosynthesis
6. study the processes of cell division and sexual reproduction
7. learn the principles of genetics and solve genetic problems
8. study the molecular characteristics of nucleic acids (DNA and RNA) and how nucleic acids and protein synthesis are interrelated
9. Understand the theory of evolution, the origin and the biodiversity of life
10. Identify the different living organisms and their major characteristics
11. Run simple experiments and interpret the data

## **Exams**

Midterm 1: 20%

Midterm 2: 20%

Final Exam: 35%

Laboratory Reports and Quizzes: 25%

## **Course policy**

- 1) Class attendance is essential for a comprehensive understanding of the material.
- 2) **No Make-Up exams!**