

**Course Outline**

# General Biology (Biol 131)

**Instructors: Dr. Munir Naser, Dr. Omar Saleh, Ms. Yara Ibrahim Second Semester 15/16**

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**Aims**

Students will be introduced to basic concepts of the chemical basis of life, cell structure and function. Major metabolic pathways in animal and plant cells (photosynthesis & cellular respiration). Furthermore, they will study in details the cell cycle and reproduction (mitosis & meiosis).

Comparative study of different animal systems will be done in which the human systems will be studied in detail. These systems are Circulatory, Respiratory, Digestive and Reproductive Systems.

## Evaluations

First Exam 25%

Second Exam 25%

Final Exam 50%

## Textbook

Reece, J. B. *et al,* (2011) **Campbell Biology, 9th ed.** Pearson Education.

**Course outline Chapter Pages # Lectures**

### Introduction 1 47-63 2

### 1.1 Properties of life

### 1.2 Evolution

### 2) Water 3 92-103 2

3.1 Polarity-H-Bonding

3.2 Emergent Properties

3.3 Acids-bases

**3) Large Biological Molecules 5 114-137 4**

5.1 Macromolecules

5.2 Carbohydrates

5.3 Lipids

5.4 Proteins

5.5 Nucleic acids

### 4) A Tour of the Cell 6 140-170 6

6.1 Studying the cell

6.2 Eukaryotic cells

6.3 Nucleus & Ribosomes

6.4 Endomembrane system

6.5 Mitochondria & chloroplasts

6.6 Cytoskeleton

6.7 Extracellular components

#### First Exam

### 5) Membrane Structure and Function 7 171-187 2

7.1 Fluid mosaic model

7.2 Membrane selective permeability

7.3 Passive transport

7.4 Active transport

7.5 Bulk transport (Endocytosis and exocytosis)

### 6) Cellular Respiration 9 209-229 4

9.1 Catabolic pathways

9.2 Glycolysis

9.3 Citric acid cycle

9.4 Oxidative phosphorylation and chemiosmosis

9.5 Fermentation

9.6 Glycolysis-citric acid cycle and other pathways

### 7) Photosynthesis 10 230-245 2

10.1 Photosynthesis: light energy to chemical energy

10.2 Light reaction

10.3 Calvin cycle

### 8) Cell Cycle 12 274-283 2

12.1 Cell division (Mitosis)

12.2 The cell cycle-binary fission

### 9) Meiosis 13 294-303 2

#### 13.1 Offspring acquire genes from parents

13.2 Sexual life cycle (fertilization-meiosis)

13.3 Meiosis: diploid to haploid

#### Second Exam

### 10) Mendel and the Gene Idea 14 308-315 4

14.1 Mendel’s experiments and laws

14.3 Non-Mendelian genetics: Incomplete dominance; codominance; multiple alleles. **317-321**

### 11) Animal Nutrition 41 921-942 3

41.1 The animal’s diet

41.2 Stages of food processing

41.3 Organs associated with food processing

41.5 Homeostasis-animal’s energy balance

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### 12) Circulation and gas exchange 42 943-974 4

##### 42.1 Circulatory systems-Exchange systems

##### 42.2 Double circulation in mammals

##### 42.3 Blood pressure-vessels structure

##### 42.4 Blood components

##### 42.5 Respiratory surfaces

##### 42.6 Breathing ventilated the lungs

##### 42.7 Respiratory pigments

#### Final Exam