



Department of General Science

College of Basic Education

Salahaddin University-Erbil

Subject: Animal Physiology

Course Book – (Year: 3)

Second Semester

Lecturer's name: Dr. Gihan Hamasharif Hamad

Academic Year: 2022-2023

Course Book

1. Course name	Animal Physiology
2. Lecturer in charge	Dr. Gihan Hamasharif Hamad
3. Department/ College	General Science/ Basic Education College
4. Contact	e-mail: gihan.hamad@su.edu.krd
5. Time (in hours) per week	Theoretical: 4 hrs. ; Practical: 9 hrs.
6. Office hours	
7. Course code	
8. Teacher's academic profile	Born in 1977. She received her M.Sc. degree in 2003 (Genetics). Also, she received her Ph.D. degree in 2016 (Human Molecular Genetics), having more than 16 years of teaching experience, is working as Lecurure (Human Molecular Genetics) in Department of General Science, College of Basic Education, Salahaddin University-Erbil, Kurdistan Region of Iraq. She was participated some conferences and International conferences in Kurdistan Region of Iraq. She was teaching several topics in Department of General Science and also at Evening.
9. Keywords	Physiology, Muscular system, physiology of digestion.....
10. Course overview: <p>Animal physiology is the study of how animals' bodies function in their environment. An understanding of the physiological problems animals face and how they solve those problems can be achieved only in an evolutionary context. Knowledge of certain aspects of the natural history, morphology, behavior, and environment of an animal is necessary to fully appreciate the importance of its physiological mechanisms.</p> <p>The study of animal physiology includes topics such as: gas exchange, feeding and digestion, circulation, metabolic rate, water and solute regulation, temperature regulation, excretion of wastes, and movement. The comparative approach can help us to develop a general evolutionary framework in which to address physiological problems. By comparing how different animals solve related problems in various environments, we can begin to gain insight into physiological principles that apply across levels of organisms and environments.</p> <p>This course is designed to give an overview of haematology and animal physiology at the level of the third year biology student. The course consists of basic/clinical science lectures combined with relevant laboratory exercises associated with each given hematologic and physiology disorder.</p>	
11. Course objective: <p>Animal physiology is the study of how animals function. Our understanding of animal function requires that we integrate our knowledge of biological processes across many levels from the molecular and cellular level through tissues and organ systems and ultimately to the whole animal itself. Physiological mechanisms by which animals acclimatize, adapt and survive in varying environments are exquisitely regulated. All animals share the challenge of acquiring</p>	

resources (e.g. nutrients, oxygen, water) and removing waste (e.g. unused food, carbon dioxide) to maintain homeostasis, but there are many different pathways to achieve these needs. Animal physiology will compare how different animal taxa achieve homeostasis by studying diverse physiological adaptations in a variety of environments. Lectures will focus on physiological systems and labs will give hands-on experience to test the principles learned in class.

12. Student's obligation

The role of students and their obligations throughout the academic year include:

- A. Quizzes and daily activities
- B. 1st examination
- C. 2nd examination
- D. Final examination

13. Forms of teaching

- Lectures (Power Point presentation): One lectures per week for 24 weeks are given. The students are encouraged to actively share in discussion during the session, stimulating questions are also posed by the lecturer and short in-class tests (multiple choices quizzes) are given at regular interval to examine factual knowledge and stimulate background revision.
- Practical sessions are arranged in the students' lab. One 3-hour practical classes/week for 24 weeks is given.
- Lectures notes and handouts are also given to the students.
- Students are also directed to the relevant primary literature, book sections and internet resources from which they can find useful information.

14. Assessment scheme

No.	Exam (Evaluation)	Marks
1.	Quizzes and daily activities	10%
2.	1 st Exam	15%
3.	2 nd Exam	15%
5.	Final Exam	60%
6.	Total Scores	100%

15. Student learning outcome:

After completing this course, students should be able to describe, identify, and/or explain:

1. The various physiological organ-systems and their importance to the integrative functions of the human body.
2. Movement of water and solutes between the fluid compartments.
3. The concept of homeostasis, including set point, negative and positive feedback loops, and compensatory responses.
4. Structure of biological membranes. Function of biological membranes including the role of membrane proteins in catalysis, recognition, and transport.
5. Demonstrate an understanding of the components of human blood and characteristics, functions, and abnormalities and disease states of each.
6. Demonstrate proficiency in the skills necessary to perform blood cell counts, and evaluation of blood elements within stated limits of accuracy.
7. Motility, secretion, digestion, absorption in the gastrointestinal system.
8. Organization structural and functional organization of the nervous system, including the central and peripheral nervous systems, the autonomic nervous system, and the enteric nervous system.

9. Structure and function of skeletal muscle, including excitation-contraction coupling, sliding filament mechanism, force generation, and isometric versus isotonic contractions.
10. Structure and functions of the cardiovascular system, including the mechanical and electrical properties of cardiac muscle function.
11. Reflex regulation of blood pressure.
12. Principles of hormone action, including structure, mechanism of release from endocrine cell, mode of transport in blood, mechanism of action in target cells, and systemic effects of important hormones.
13. Structure and functions of the kidney nephrons, including glomerular filtration, tubular reabsorption, tubular secretion, and excretion.

16. Course Reading List and References:▪ **Key references:**

1. Textbook of Medical Physiology by Arthur C. Guyton and John E. Hall, 11th edition, 2006.
2. Essentials of Anatomy and Physiology by Valerie C. Scanlon and Tina Sanders, 5th edition, 2007.

▪ **Useful references:**

1. Essentials of animal physiology by S. C. Rastogi, 4th edition, 2007.
2. Essentials of human anatomy and physiology by Elaine N. Marieb, 5th edition, 2012.

▪ **Magazines and review (internet):**

17. The Topics:	Lecturer's name
1. Introduction to animal physiology Definition of physiology, branches of physiology	Time: 2 hrs. Date:
2. Cellular transport mechanism Passive transport mechanisms, active transport mechanisms	Time: 2 hrs. Date:
3. Intercellular chemical messengers Cell communication and cell signalling	Time: 2 hrs. Date:
4. Membrane potential Resting membrane potential, action potential	Time: 2 hrs. Date:
5. Muscular system Properties of muscle, muscle tissue types, skeletal muscle	Time: 2 hrs. Date:
6. Digestive system Digestive processes and human nutrition	Time: 2 hrs. Date:
7. Examination First examination	Time: 2 hrs. Date:
8. The nervous system Neurons, neuroglia, functions of the nervous system	Time: 2 hrs. Date:
9. Human respiratory system Organs of the respiratory system, lungs	Time: 2 hrs. Date:
10. The circulatory system Division of circulation, the heart, the heartbeat cycle	Time: 2 hrs. Date:
11. Urinary system Kidneys, kidney function, nephron	Time: 2 hrs. Date:
12. Endocrine system General features, classes of hormones, hormone actions	Time: 2 hrs. Date:
13. Endocrine system	Time: 2 hrs.

Biological Clocks	Date:
14. Examination Second examination	Time: 2 hrs. Date:
18. Practical Topics (If there is any)	
19. Examinations: 1. Compositional: <ul style="list-style-type: none"> Active transport mechanisms involve the cell to use cellular energy usually in the form of ATP to power special protein pumps to bring material into the cell. Why? Answer: Active transport is the energy-demanding transfer of a substance across a cell membrane against its concentration gradient, i.e., from lower concentration to higher concentration. 2. True or false type of exams: <ul style="list-style-type: none"> The osmotic pressure are depends on mass but not numbers of particles per unit volume of fluids. (False) Coagulation system consists of a series of proteins (coagulation factors) that activate in a step-by-step process called the bleeding cascade. (False) Because they lack a cytoplasm, the RBCs stay viable for only about 120 days. (False) 3. Multiple choices: <ul style="list-style-type: none"> The term used to describe, "cell eating" is? A. Exocytosis B. Pinocytosis C. Phagocytosis D. Diffusion A typical neuron has a resting membrane potential of about: A. +70 mV B. -70 mV C. +70 V D. -70 V The concentration of sodium is highest [outside / inside] the cell, while for potassium, the reverse is true. 	
20. Extra notes:	
21. Peer review	پیداچوونہودی هاوہل