The Hashemite University
Faculty of Science
Course Syllabus

Department of Biology and Biotechnology

Course Title: Functional Anatomy /Animal Physiology)
Course Number: ……/…….
Pre-requisite: …/……
Credit Hours: 3
Designation: Required
Instructor: Dr. Esam Qnais
Instructor's E-mail: Esamqn@hu.edu.jo
Office Hours :S -10-11, M and W 10.30-11,

Course Description (Catalog):
Theory :
This course will be designed to cover the basic principles of functional anatomy (physiology). Like a textbook it would be impossible to cover all topics of physiology in a single course. Therefore we will focus on the most important and generalized principles such as circulation, movement, respiration, and nerve conduction. Unfortunately there won't be time enough to cover some of the more specific, and interesting, aspects of physiology (e.g. specific sensory systems, specific systems of motility, etc.) but there are several other courses offered that can build upon what you learn in this course. It is hoped that when a student successfully completes this

they will have a working understanding of how human (Animal) body function, and how the specific mechanisms of physiology relate to structure and the environment.

Lab:

The course includes up to (12) laboratory experiments. Each unit is designed to illustrate one of more specific aspects of physiology. Although most labs will be associated with a specific topic covered in the lecture and will serve to enhance the students learning of that topic others will be more independent and may serve as the students' only exposure to the theory.

Text Book:

- Essentials of Animal Physiology, by S.C. Rastogi , 4th edition, 2008

Vander's human physiology: The mechanisms of body function by Eric P. Widmaier, Hershel Raff, Kevin T. Strang 13th edition. 2015

- ***Experiments in physiology*** by Gerald D Tharp-
- Weekly lab exercises will be posted on the course website

Major Topics Covered:

Topics	**No.of Weeks/ Contact Hours**
Introduction to the Course	1/2
Skeletal system	2/2
Muscular system	3/2
Muscular system	4/2
Nervous system	5/2
Nervous system	6/2
Endocrine system	7/2
Endocrine system **MID EXAM**	8/2

Circulatory system	9/2
Circulatory system	10/2
Respiratory system	11/2
Respiratory system	12/2
Digestive system	13/2
Reproductive system	14/2
Lymphatic system	14/2 15/2
Final exam	16

Schedule of lab meetings:

Lab	**No.of Weeks Contact Hours**
Introduction	1/3
Microscopic calibration	2/3
Cell transport mechanisms	3/3
Blood physiology	4/3
Blood physiology	5/3
Physiology of muscle contraction	6/3
Cardiac Physiology	7/3
Mid-term exam	8/1
Measurement of Blood Pressure and Electrocardiogram and Heart Sounds	9/3
Pulmonary Ventilation	10/3
Renal functions	11/3

Hormones and metabolic rate	12/3
Hormone and reproductive system	13/3
Digestive system experiment	14/3
Final exam	15/1

Upon successful completion of lecture portion of this course, the students will be able to :describe, identify, and/or explain

	Course Learning Outcomes (CLO)	**(SO*)**
CLO1	The various physiological organ-systems and their importance to the integrative functions of the human body.	(a), (b),(d), (k)
CLO2	Body fluid compartments and the ionic composition of body fluids.	(a), (b),(d), (k)
CLO3	Movement of water and solutes between the fluid compartments	(a), (b),(d), (k)
CLO4	The concept of homeostasis, including set point, negative and positive feedback loops, and compensatory responses.	(a), (b),(d), (k)
CLO5	Intracellular and extracellular communication systems.	(a), (b),(d), (k)
CLO6	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	(a), (b),(d), (k)
CLO7	The resting membrane potential.	(a), (b),(d), (k)
CLO8	The action potential, action potential propagation along the axon.	(a), (b),(d), (k)
CLO9	Chemical messenger molecules of the nervous system, including classical and non-classical neurotransmitters	(a), (b),(d), (k)
CLO10	Synaptic neurotransmission.	(a), (b),(d), (k)
CLO11	Basic principles of sensory physiology.	(a), (b),(d), (k)
CLO12	Structure and function of skeletal muscle, including excitation-contraction coupling, sliding filament mechanism, force generation, and isometric versus isotonic contractions.	(a), (b),(d), (k)
CLO13	Structure and functions of the cardiovascular system, including the mechanical and electrical properties of cardiac muscle function.	(a), (b),(d), (k)
CLO14	Excitation-contraction coupling in cardiac muscle	(a), (b),(d), (k)
CLO15	Reflex regulation of blood pressure.	(a), (b),(d), (k)

CLO16	Structure and functions of the respiratory system, including lung volumes, gas exchange, and gas transport in blood.	(a), (b),(d), (k)
CLO17	Regulation of ventilation	(a), (b),(d), (k)
CLO18	Structure and functions of smooth muscle, including excitation-contraction coupling in smooth muscle.	(a), (b),(d), (k)
CLO19	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.	(a), (b),(d), (k)
CLO20	Functions of the endocrine system with focus on classic endocrine glands, including the hypothalamus and the pituitary glands, thyroid and parathyroid glands, adrenal glands, endocrine pancreas.	(a), (b),(d), (k)
CLO21	The renin-angiotensin-system.	(a), (b),(d), (k)
CLO22	Structure and functions of the kidney nephrons, including glomerular filtration, tubular reabsorption, tubular secretion, and excretion.	(a), (b),(d), (k)
CLO23	Transport of water, ions, and organic molecular across the tubular epithelia	(a), (b),(d), (k)
CLO24	Renal clearance.	(a), (b),(d), (k)
CLO25	Urinary concentrating mechanisms.	(a), (b),(d), (k)
CLO26	Acid-base balance.	(a), (b),(d), (k)
CLO27	Motility, secretion, digestion, absorption in the gastrointestinal system	(a), (b),(d), (k)

*(SO) = Student Outcomes Addressed by the Course.

- **Student Outcomes (SO) Addressed by the Course:**

#	Outcomes Description Applied and Natural Sciences Student Outcomes	Contribution
(a)	an ability to apply knowledge of mathematics, science, and applied sciences	H
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	M
(c)	an ability to formulate or design a system, process or program to meet desired needs	M
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify and solve applied sciences problems	M
(f)	an understanding of professional and ethical responsibility	M
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of solutions in a global and societal context	M

(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	M
(k)	an ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice.	M
Low=**L** ,Medium =**M** ,High=**H**		

Assessment Instruments

	Mark
lecture first	**15%**
Second	**15 %**
Final Exam	**40%**
Lab	
Mid	10%
Quizzes	5%
Final	15%

Course policies

University regulations apply to this course regarding class attendance, punctuality, exams, late submissions, absence with permission, penalties for cheating, and policies for assignments and projects, if any. Students should be aware of all those in addition to other rules and regulations stated and descried in the student handbook