



كلية الصيدلة جامعة الزيتونة الأردنية
Faculty of Pharmacy
Al-Zaytoonah University of Jordan

" نحو تعليم صيدلاني متميز "
Toward Excellence in Pharmaceutical
Education

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"Tradition and Quality"

Detailed Course Description - Course Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-3.0E
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Faculty	Pharmacy	Department	Pharmacy
Course number	0201233	Course title	Physiology 1
Number of credit hours	2	Pre-requisite/co-requisite	Anatomy and Histology

Brief course description

In this course the prevalent theories of body function are studied, explained and discussed as a mandatory for understanding pharmacology and pathology taught in later years. The student studies and analyzes how human body systems act together in complex body functions. In this course we will emphasize on the mechanisms of communication between body systems and the importance of these mechanisms in maintaining homeostasis and correct functioning of other body systems.

في هذا يتم دراسة النظريات السائدة في وظائف الجسم، وشرحها ومناقشتها باعتبارها أساسية لفهم علم الأدوية وأمراض الذي يتم تدريسه في السنوات اللاحقة. يدرس الطالب ويحلل كيفية عمل أنظمة جسم الإنسان معاً. سيتم التركيز في هذا المساق على آليات التواصل بين أنظمة الجسم وأهمية هذه الآليات في الحفاظ على بطريقة صحيحة.

Course goals and learning outcomes	
Goal 1	The course will grant students knowledge and understanding to the role of the nervous and endocrine system in maintaining homeostasis in addition to an understanding of the interactions between cells and the extracellular environment.
Learning outcomes	<p>1.1 Explain and give examples of how the nervous and endocrine systems help to regulate body systems and maintain homeostasis.</p> <p>1.2 Distinguish between and give examples of the different types of transport along the plasma membrane.</p> <p>1.3 Describe the membrane potential and explain how it is produced.</p>
Goal 2	The students are expected to acquire knowledge and understanding about the physiology of the nervous system and the muscular system.
Learning outcomes	<p>2.1 Describe the function of different types of neurons and supporting cells.</p> <p>2.2 Describe the electrical activity in axons and synapses and identify the nature of excitatory and inhibitory postsynaptic potentials.</p> <p>2.3 Explain the physiology of the autonomic nervous system and the mechanisms of contraction.</p>
Goal 3	Provide the students with knowledge and understanding about the functions of the circulatory system and the respiratory system.
Learning outcomes	<p>3.1 Explain the function and control of the heart and blood vessels in humans and the mechanisms regulating cardiac output, blood pressure, blood volume and blood flow.</p> <p>3.2 Describe the cardiac cycle and the electrical activity of the heart and their relation to the Electrocardiogram.</p> <p>3.3 Describe the mechanism of respiration and transport of oxygen and carbon dioxide.</p>
Textbook	1. Human Physiology, 14th edition, Stuart Ira Fox, McGraw Hill, 2016.



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Supplementary references	<ol style="list-style-type: none"> Essentials of Human Anatomy and Physiology, 11th edition, Marieb E.N. (2015) Pearson Education, Inc. Principles of Anatomy and Physiology, 13th edition, Gerard J. Tortora and Bryan H. Derrickson (2012), Wiley and Sons, Inc. Online Learning Center: http://highered.mheducation.com/sites/0073403628/student_view0/index.html
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Course timeline

Week	Number of hours	Course topics	Pages (textbook)	Notes
1	1 1	Introduction to Physiology; 1.2 Homeostasis of internal environment & feedback: Negative feedback loops; Positive feedback; Neural & endocrine regulation; Feedback control of hormone secretion.	1-10	Chapter 1
2	1 1	Functions of the plasma membrane: 6.1 Extracellular Environment; 6.2 Diffusion and osmosis; Regulation of blood osmolality; 6.3 Carrier-mediated transport; Facilitated diffusion; Active transport; Bulk transport;	130-148	Chapter 6
3	1 1	6.4 The Membrane Potential; Equilibrium potentials; Resting membrane potential.	149-153	Chapter 6
4	1 1	The Nervous System (Neurons & Synapses): 7.1 Neurons & supporting cells; Neurons; Classification of Neurons and Nerves; Neuroglial cells 7.2 Electrical activity in axons; Ion gating in axons;	163-174	Chapter 7
5	1 1	Action potentials; All or none law; Coding for stimulus intensity; Refractory Periods; Conduction of nerve impulses in myelinated and unmyelinated axons;	174-180	Chapter 7
6	1 1	7.3 Synapse; Electrical & chemical synapses; Actions of neurotransmitter; 7.4 Acetylcholine as a neurotransmitter; Chemically regulated channels; Ligand-operating channels; G-Protein-operating channels; Acetylcholinesterase.	180-189	Chapter 7
7	1 1	The Autonomic Nervous System: 9.1 Neural control of involuntary effectors; Autonomic neurons; 9.2 Divisions of the Autonomic nervous system; Sympathetic division; Collateral ganglia; Adrenal glands; Parasympathetic division;	244-251	Chapter 9
8	1 1	9.3 Functions of the Autonomic nervous system; Adrenergic & cholinergic synaptic transmission; Responses to adrenergic stimulation; Responses to cholinergic stimulation; Organs with dual innervation (examples). Organs without dual innervation.	251-260	Chapter 9
9	1 1	Muscle: Mechanisms of Contraction and Neural Control: 12.1 Skeletal Muscles; Structure of Skeletal Muscles; Motor end plates and Motor units; 12.2 Mechanisms of Contraction; Sliding Filament Theory of Contraction; Regulation of Contraction.	360-373	Chapter 12



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Week	Number of hours	Course topics	Pages (textbook)	Notes
10	1 1	Heart & Circulation: 13.1 Functions of the circulatory system; Major components of the circulatory system; 13.2 Composition of the blood; Plasma; <i>In brief: Formed elements of blood; Erythrocytes; Leukocytes; Platelets; Hematopoiesis; Regulation of Erythropoiesis;</i> Blood clotting; Platelets and blood vessel walls; Clotting factors : formation of fibrin; Dissolution of clots; Anticoagulants.	405-412 414-418	Chapter 13
11	1 1	13.3 Structure of the heart: Pulmonary & systemic circulation; Atrioventricular & semilunar valves; Heart sounds; Heart murmurs (<i>in brief</i>); 13.4 Cardiac cycle; Pressure changes during cardiac cycle;	418-424	Chapter 13
12	1 1	13.5 Electrical activity of the heart & the ECG; Electrical activity of the heart; Pacemaker potential; Myocardial action potential; Conduction tissues of the heart; Conduction of the Impulse; Excitation-contraction coupling in heart muscle; the Electrocardiogram.	425-431	Chapter 13
13	1 1	Cardiac Output, Blood flow, & Blood Pressure: 14.1 Cardiac output; Regulation of cardiac rate; Regulation of stroke volume; Frank-Starling Law of the heart; Intrinsic control of contraction; Extrinsic control of contractility; Venous return; 14.2 Blood volume; Exchange of fluid between capillaries and tissues;	450-458	Chapter 14
14	1 1	14.3 Vascular Resistance to blood flow; Extrinsic regulation of blood flow; Regulation by sympathetic nerves; Parasympathetic control of blood flow; Paracrine regulation of blood flow; Intrinsic regulation of blood flow; Myogenic control mechanisms; Metabolic control mechanisms; 14.6 Blood Pressure; Baroreceptor reflex; Atrial stretch reflexes.	463-468 475-479	Chapter 14
15	1 1	Respiratory System: 16.1 Structure of respiratory system; 16.2 Physical aspects of ventilation; Intrapulmonary & Intrapleural pressures; Boyle's law; Physical properties of the lungs; Compliance; Elasticity; Surface tension; Surfactant & the respiratory distress syndrome; 16.3 Mechanics of breathing	532-543	Chapter 16
16	1 1	Exams	-	-

Theoretical course evaluation methods and weight	First exam 25% Second exam 25% Final exam 50%
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Approved by head of department		Date of approval	
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Extra information (to be updated every semester by corresponding faculty member)

Name of teacher	Wassan Ghaleb Jarrar	Office Number	215
Phone number (extension)	271	Email	wassan.jarrar@zuj.edu.jo
Office hours			