Course Plan for Bachelor Program - Study Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-4.0E

Study Plan No.	**2021/2022**		**University Specialization**		**Bachelor of Pharmacy**	
Course No.	**0201133**		**Course Name**		**Anatomy and Physiology (1)**	
Credit Hours	**3**		**Prerequisite *Co-requisite**		**Biology**	
Course Type	☐ Mandatory University Requirement	☐ University Elective Requirement	☑ **Faculty Mandatory Requirement**	☐ Support course family requirements	☐ Mandatory Requirement	☐ Elective Requirement
Teaching Style	☐ Full Online Learning		☐ Blended Learning		☑ **Traditional Learning**	
Teaching Model	☐ 2 Synchronous: 1 Asynchronous		☐ 2 Face to Face: 1 Asynchronous		☑ **2 Traditional**	

Faculty Member and Study Divisions Information *(to be filled in each semester by the subject instructor)*

Name	Academic rank	Office No.	Phone No.	E-mail	
Office Hours (Days/Time)	**Sunday, Tuesday, Thursday ()**		**Monday, Wednesday ()**		
Division number	**Time**	**Place**	**Number of Students**	**Teaching Style**	**Approved Model**
				Traditional Learning	**3 Traditional**

Brief Description

This course covers the structure and function of the nervous system, sense organs, endocrine system, and the muscular system. It is designed to discuss and explain how these systems act together in complex body functions. The course also emphasizes on their mechanisms of communication and their importance in maintaining homeostasis.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	Human Physiology, Stuart Ira Fox, 2019, 15th edition, Mc Graw Hill.			
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. Essentials of Human Anatomy and Physiology, Elaine Marieb, 2015, 11th edition, Pearson Education, Inc. 2. Principles of Anatomy and Physiology, Gerard J. Tortora and Bryan H. Derrickson, 2012, 13th edition, Wiley and Sons, Inc.			
Supporting Websites	-			
The Physical Environment for Teaching	☑ **Classroom**	☐ Labs	☑ **Virtual Educational Platform**	☐ Others
Necessary Equipment and	Moodle			

Software	
Supporting People with Special Needs	-
For Technical Support	E-Learning & Open Educational Resources Center. Email: elearning@zuj.edu.jo; Phone: +962 6 429 1511 ext. 425/362.

Course learning outcomes *(K= Knowledge, S= Skills, C= Competencies)*

No.	Course Learning Outcomes	The Associated Program Learning Output Code
Knowledge **The student should be able to:**		
K1	Define homeostasis and describe how this concept can be used to explain physiological control mechanisms.	**MK1**
K2	Recognize the different mechanisms of transport across the cellular plasma membrane.	**MK1**
K3	Identify the structure and the main components of the nervous, special senses, endocrine, and muscular systems.	**MK1**
K4	Describe the functions of the body systems covered in this course.	**MK1**
Skills **The student should be able to:**		
S1	Explain how the nervous and endocrine systems regulate other body systems to maintain homeostasis.	**MS2**
Competencies **The student should be able to:**		
C1	Develop his/her professional and personal performance by continuously following-up lectures and submitting tasks on time.	**MC3**

Mechanisms for Direct Evaluation of Learning Outcomes

Type of Assessment / Learning Style	Fully Electronic Learning	Blended Learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm Exam	30%	30%	**30%**	25%
Participation / Practical Applications	0%	0%	**20%**	25%
Asynchronous Interactive Activities	20%	20%	**0%**	0%
Final Exam	50%	50%	**50%**	50%

Note 1: *Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, and work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.*

Note 2: *According to the Regulations of granting Master's degree at Al-Zaytoonah University of Jordan, 40% of final evaluation goes for the final exam, and 60% for the semester work (examinations, reports, research or any scientific activity assigned to the student).*

Schedule of Simultaneous / Face-to-Face Encounters and their Topics

Week	Subject	Learning Style*	Reference **
1	**Introduction to Physiology; Homeostasis & feedback control:** Negative feedback loops; Positive feedback; Neural & endocrine regulation; Feedback control of hormone secretion. **Interactions between cells and the extracellular environment**: Extracellular Environment; Diffusion and osmosis; Carrier-mediated transport.	**Lecture**	**Chapter 1 pages 5-10** **Chapter 6 pages 130-149**
2	The Membrane Potential; Equilibrium potentials; Resting membrane potential.	**Lecture**	**Chapter 6 pages 149-153**
3	**The Nervous System:** Classification of Neurons and Nerves; Neuroglial cells; Electrical activity in axons; Ion gating in axons; Action potentials.	**Lecture**	**Chapter 7 pages 162-167, 172-175**
4	All or none law; Coding for stimulus intensity; Refractory Periods; Conduction of nerve impulses in myelinated and unmyelinated axons; Synapse; Electrical & chemical synapses.	**Lecture**	**Chapter 7 pages 176-182**
5	Actions of neurotransmitter; Acetylcholine as a neurotransmitter; chemically regulated channels; Ligand-operating channels; G-Protein-operating channels; Acetylcholinesterase.	**Lecture**	**Chapter 7 pages 183-189**
6	**Central nervous system:** Structural organization of the brain; Cerebrum: Cerebral cortex (Electroencephalogram, Sleep); Basal nuclei; Cerebral lateralization; Language; Limbic system and Emotion; Memory.	**Lecture**	**Chapter 8 pages 206-220**
7	Diencephalon: Thalamus and Epithalamus; Hypothalamus and Pituitary gland; Regulation of Autonomic system; regulation of circadian rhythms.	**Lecture**	**Chapter 8 pages 225-228**
8	Midbrain and Hindbrain: Midbrain; Hindbrain; Reticular Activating System in Sleep and Arousal; Spinal cord tracts: Ascending tracts; Descending tracts. Protection of the CNS (Meninges, CSF).	**Lecture**	**Chapter 8 pages 228-238**

	Peripheral nervous system: Cranial and Spinal nerves		
9	**The Autonomic Nervous System:** Neural control of involuntary effectors; Autonomic neurons; Visceral effector organs; Divisions of the Autonomic nervous system; Sympathetic division; Collateral ganglia; Adrenal glands; Parasympathetic division. **Midterm Exam**	**Lecture**	**Chapter 9 pages 243-251**
10	Functions of the Autonomic nervous system; Adrenergic & cholinergic synaptic transmission; Responses to adrenergic stimulation; Responses to cholinergic stimulation; other Autonomic neurotransmitters; Organs with dual innervation (examples). Organs without dual innervation.	**Lecture**	**Chapter 9 pages 251-260**
11	**Endocrine system:** Endocrine Glands and Hormones: Chemical classification of Hormones; Hormone interactions. Mechanism of Hormone Action: Hormones that bind to Nuclear Receptor Proteins; Hormones that use second messengers.	**Lecture**	**Chapter 11 pages 316-331**
12	Pituitary gland: Pituitary hormones; Hypothalamic control of the Posterior Pituitary; Hypothalamic control of the Anterior Pituitary; Feedback control of the Anterior Pituitary. Adrenal glands: Functions of the adrenal Cortex; Functions of Adrenal Medulla; Stress & the Adrenal gland; Thyroid & Parathyroid Glands: Production & action of thyroid hormones; Parathyroid gland.	**Lecture**	**Chapter 11 pages 331-345**
13	**Sensory physiology**: Functional Categories of sensory receptors; Cutaneous sensations; Taste and Smell; Vestibular Apparatus & Equilibrium: Sensory hair cells of the Vestibular apparatus; Utricle & Saccule; Semicircular canals; Neural pathways for equilibrium and balance. The Ears & Hearing: Outer Ear; Middle Ear; Cochlea; Spiral organ (Organ of	**Lecture**	**Chapter 10 pages 266-289**

	Corti); Neural pathways for hearing.		
14	The Eyes and Vision: Refraction; Accommodation; Visual acuity; Retina: Effect of light on the rods; Electrical activity of retinal cells; Cones & color vision; Visual acuity & sensitivity.	**Lecture**	**Chapter 10 pages 290-305**
15	**Muscle: Mechanisms of Contraction and Neural Control:** Skeletal Muscles; Structure of Skeletal Muscles; Motor end plates and Motor units; Mechanisms of Contraction; Sliding Filament Theory of Contraction; Regulation of Contraction.	**Lecture**	**Chapter 12 pages 359-373**
16	**Final Exam**		

** Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.*
*** Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.*

Schedule of Asynchronous Interactive Activities *(in the case of e-learning and blended learning)*

Week	Task / Activity	Reference	Expected Results
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