The University of Jordan

الجامعة الاردنية

Form: Course Syllabus	Form Number	EXC-01-02-02A
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1.	Course Title	Neurosciences and Behavior العلوم العصبية و السلوك
2.	Course Number	0500309
3.	Credit Hours (Theory, Practical)	8
	Contact Hours (Theory, Practical)	88 Lectures and 10 Labs
4.	Prerequisites/ Corequisites	
5.	Program Title	Doctor of Medicine
6.	Program Code	05
7.	School/ Center	School of Medicine
8.	Department	Anatomy & Histology, Physiology & Biochemistry, Pathology, Microbiology, Pharmacology
9.	Course Level	Bachelor
10.	Year of Study and Semester (s)	Third year/ Second Semester
11.	Program Degree	
12.	Other Department(s) Involved in Teaching the Course	Neurology and Neurosurgery
13.	Learning Language	English
14.	Learning Types	☐Face to face learning ☒Blended ☐Fully online
15.	Online Platforms(s)	☒Moodle ☐Microsoft Teams
16	Issuing Date	20/1/2024
17.	Revision Date	2025/5/11

18. Course Coordinator:

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19. Other Instructors:

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20. Course Description:

As stated in the approved study plan.

A- Course Description:

This course covers the study of the nervous system and special senses from the stand points of anatomy, histology and organization of the central and peripheral nervous system including the brain, spinal cord, and nerves including their motor and sensory functions in addition to the study of vision, hearing and chemical sense, cerebral cortex and intellectual functions, neurotransmission including its chemistry, receptors and neurotransmitters, and chemistry of vision. It also covers diseases of the central nervous system and organs of special senses including bacterial, viral, fungal and parasitic infections, brain edema, hydrocephalus, vascular disturbances, trauma, congenital malformations, tumors, degenerative and immune-mediated disorders and the drugs used for the treatment of these diseases. The course also covers the clinical aspects of diseases that affect the central and peripheral nervous system as well as special senses. On the other side, this course covers theories of behavior, stress physiology, interventions to change behavior, life cycle, personality, motivation, biologic basis of behavior, sleep, social determinants of behavior, disorders of cognition, memory, mood and psychotic disorders. In addition, it covers perception and thinking, violence and suicide, human sexuality, death and dying, immune and risk behavior, physician patient relationship, eating and obesity, anxiety and dissociative disorders and mental health. Experienced people are invited to give lectures or a variety of interactive activities.

B- Aims:

By the end of this course, the student should be able to:

1. Describe and identify the gross morphology and microanatomy of the central and peripheral nervous system.
2. Identify the organs of the special senses and describe their anatomical features and histology.
3. Describe the functions of the central and peripheral and relate structure to function.
4. Describe the functions of the organs of the special senses and relate structure to function.
5. List molecules involved in the normal functioning of the central and peripheral nervous systems, their characteristics and regulation.
6. List the pathologic disorders that affect the central and peripheral nervous systems, their pathogenesis, manifestations, and histological features.
7. List the infectious diseases of the CNS, including their etiologic agents, pathogenesis, manifestations and diagnosis.
8. List most important drugs used in the treatment of disorders that affect the central and peripheral nervous systems including their pharmacologic properties, indications, doses and side effects.
9. Describe the epidemiology of diseases that affect the nervous system.

Introduced to taking history and performing physical examination of the central and peripheral nervous system.

21. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

PLO's	*National Qualifications Framework Descriptors*		
	Competency (C)	Skills (B)	Knowledge (A)
1.	☐	☐	☒
2.	☐	☒	☐
3.	☒	☐	☐
4.	☐	☐	☒
5.	☐	☒	☐
6.	☒	☐	☐
7.	☐	☐	☒
8.	☒	☐	☐

* Choose only one descriptor for each learning outcome of the program, whether knowledge, skill, or competency.

1. Demonstrate basic knowledge of normal human structure and function at molecular, genetic, cellular, tissue, organ, system and whole-body levels in terms of growth, development, and health maintenance. Analyze the basic molecular and cellular mechanisms involved in the causation and treatment of human disease and their influence on clinical presentation and therapy.

2. Collect, interpret, document, and communicate accurately a comprehensive medical history, including the psychological and behavioral factors, and a thorough organ-system-specific physical examination inclusive of the mental status of the patient.

3. Integrate and communicate collected clinical information in the construction of appropriate diagnostic and therapeutic management strategies to identify life-threatening conditions ensuring prompt therapy, referral, and consultation with relevant disciplines and skillfully perform basic medical procedures for general practice on patients with common illness, acute and chronic, taking into account environmental, social, cultural and psychological factors.

4. Demonstrate in-depth knowledge of the epidemiology and biostatistics of common diseases, and analyze the impact of ethnicity, culture, socioeconomic factors and other social factors on health, disease and individual patient's health care.

5. Communicate effectively and professionally, both orally and in writing, with patients, their families, and with other healthcare providers utilizing information technology resources in his/her scholarly activities and professional development with the ability to teach others, and to understand and respect other healthcare professionals 'roles, and apply the principles of multidisciplinary teamwork dynamics and collaboration.

6. Apply scientific methods including evidence –based approach to the medical practice including problem identification, data collection, hypothesis formulation, etc., and apply inductive reasoning to problem solving and ensure that clinical reasoning and decision making are guided by sound ethical principles.
7. Demonstrate knowledge of scientific research methods and ethical principles of clinical research and be able to write research proposals or research papers.
8. Demonstrate professionally the skills needed for Quality improvement, lifelong learning, and continuous medical education including the ability to identify and address personal strength and weakness, self-assess knowledge and performance, and develop a self-improvement plan.

22. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

Course ILOs #	The learning levels to be achieved						Competencies
	Remember	Understand	Apply	Analyse	Evaluate	Create	
1.	✓	✓					Describe the different lobes of the cerebrum, sulci and gyri on the different surfaces of the cerebral hemisphere and their functions.
2.		✓	✓	✓	✓	✓	Identify and Classify CNS Pathogens and Develop the ability to identify and classify common microbial pathogens associated with CNS infections, encompassing bacteria, viruses, fungi, and parasites.
3.		✓	✓	✓	✓	✓	Analyze experimental

							models and research findings related to neurophysiological mechanisms underlying learning and memory using animal models or human studies.
4.		✓	✓	✓	✓	✓	Analyze history and pathologic features to suggest an appropriate cause of haemorrhage in different clinical scenarios.
5.	✓	✓	✓	✓	✓	✓	Define and understand the structure and function of neurotransmitters, the cellular contribution, molecular mechanism, and signaling of visual transduction and their regulation, and the biology of stem cells and their use in the treatment of neurodegenerative diseases.
.6		✓	✓	✓	✓	✓	Discuss the different characteristics of hypnotic antianxiety drugs

23. **The matrix linking the intended learning outcomes of the course -CLO's with the intended learning outcomes of the program -PLOs:**

Program ILOs / ILOs of the course	CLO (1)	CLO (2)	CLO (3)	CLO (4)	CLO (5)	CLO (6)	CLO (7)	Descriptors**		
								A	B	C
PLO (1)	√							√		
PLO (2)			√						√	
PLO (3)						√				√
PLO (4)				√				√		
PLO (5)		√							√	
PLO (6)						√				√
PLO (7)					√			√		
PLO (8)							√			√

***Linking each course learning outcome (CLO) to only one program outcome (PLO) as specified in the course matrix.**

****Descriptors are determined according to the program learning outcome (PLO) that was chosen and according to what was specified in the program learning outcomes matrix in clause (21).**

24. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome (SLO)	Descriptors **	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Anatomy Cerebral cortex lobes and surfaces of the brain	Recognize the Gross anatomy of the brain , different lobes and surfaces, sulci and gyri of the cerebral hemisphere	K	Face to face		Synchronous Lecturing	Written exam	28-8
	1.2	Anatomy Sulci and gyri of each lobe			Face to face		Synchronous Lecturing	Written exam	28-8
	1.3	Anatomy Functional areas of the cerebral cortex and their lesions	List the major areas of broadmann classification Identify clinical manifestation resulted from lesions of each cerebral area	K	Face to face		synchronous Lecturing	Written exam	28-8
	1.4	Pathology Stroke and increased intracranial pressure	1.Define stroke. 2. list types of strokes, their causes and pathologic features. 3. list causes of increased intracranial pressure.	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	
	1.5	Physiology Introduction	Understand the general organization and functions of the nervous system.	K	Face to face		Synchronous Lecturing	Written exam	
	1.6	Physiology Brainactivity	Differentiate between various states of brain activity.	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	
	1.7	Physiology Learning and memory	-Explain the underlying neurophysiological mechanisms involved in transitioning between different states of brain activity. -Apply knowledge of the neurophysiology of brain activity states in diagnosing and managing neurological conditions. Define the neurophysiological basis of learning and memory processes. -Describe the brain regions implicated in learning and memory.	K C K K	Face to face		Synchronous Lecturing	Written exam/	

			-Analyze experimental models and research findings related to neurophysiological mechanisms underlying learning and memory using animal models or human studies	S					
	1.8	Physiology Behavioral and motivational mechanisms of the brain	Explain the role of different brain regions, particularly the limbic system, hypothalamus, and prefrontal cortex in regulating and modulating behaviors and motivations. -Apply knowledge of neurophysiology of behavior and motivational mechanisms to assess and manage neurological and psychiatric conditions affecting behavior, motivation, and reward systems.	K C	Face to face		Synchronous Lecturing	Written exam	
	1.9	Microbiology Pathogens with Clinical Implications in the peripheral nervous system (PNS	Understanding infectious diseases associated with peripheral nervous system symptoms.	K	Face to face		Synchronous Lecturing	Written exam	Harrison's Infectious Diseases 3rd Edition. SECTION III Infections in organ systems. Chapter 33.
	1.10	Pharmacology Anxiolytic and Hypnotic	1. Define some types of anxiety and insomnia disorders 2. Classify types of drugs used for treatment of anxiety and insomnia 3. Discuss the different characteristics of hypnotic antianxiety drugs	K C C	Face to face		Synchronous Lecturing	Written exam	
	1.11	Behavior Introduction to Psychology	1. Understand what is psychology 2. Differentiate between the multiple perspectives of psychology	C C	Face to face		Synchronous Lecturing	Written exam	Sides
	1.12	Behavior Brain and Behavior	1. Understand the multiple factors influencing human behaviors 2. Understand how brain structures influence human behaviors 3. Understand the functions of brain systems		Face to face		Synchronous Lecturing	Written exam	Sides
Week	Lecture	Topic	Student Learning Outcome (SLO)	Descriptors **	Learning Methods (Face to Face/Blende d/ Fully	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
2	2.1 And	Anatomy	* Describe different parts, location and anatomical relations of the lateral,	K	Face to face		Synchronous Lecturing	Written exam	28-8

	2.2	Anatomy of the ventricular system	Third and fouth ventricles. * Identify brain meninges, subarachnoid cisternae, cerebrospinal fluid circulation and communication between different brain ventricles. * Locate sites of epidural anesthesia and CSF puncture	C K					
	2.3	Anatomy Anatomy of the basal nuclei	*Distinguish difernt parts of basal nuclei, anatomical relation and function of each. *Describe different parts of the internal capsule, anatomical relation, fibers passing inside each part and resulted lesion	K	Face to face		Synchronous Lecturing	Written exam	28-8
	2.4	Pathology Brain Haemorrage	1-List causes of traumatic and non traumatic brain hemorrhage. 1. Analyse history and pathologic features to suggest an appropriate cause of haemorrhage in different clinical scenarios. 2. Recognize clinical and pathological features of brain haemorrhage. 4- Differentiate between subdural and epidural hematomas.	K	Face to face		Synchronous Lecturing	Written exam/	
	2.5	Pathology Myelin diseases of the CNS	• 1. Describe the epidemiology, and clinical features of multiple sclerosis 2. List the morphologic features of MS. 3. Describe the pathogenesis of MS. 4. Describe the pathogenesis of pontine myelinolysis, neuromyelitis Optica and post infectious demyelination. 5. Differentiate between dysmyelinating diseases and their clinical presentation.	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	
	2.6	Biochemistry Visual transduction	Define the cellular contri bution, molecular mech anism, and signaling of visual transduction and their regulation 2. Understand d the genetics of color vision and color blind ness.	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	Webvision: The Organization of the Retina and Visual System (https://www.ncbi. nlm.nih.gov /books/NBK52768/) 2. The Molecular Design of Visual Transduction (https://www.bioph

									ysics.org/Portals/0/BPSAssets/Articles/Phototransduction.pdf)
	2.6	Physiology Cortical control of motor function	-Define the cortical regions involved in motor control, and their functional contributions to motor planning, execution, and coordination. -Perform neurological assessments to evaluate motor function and to detect abnormalities related to motor function.	K S	Face to face		Synchronous Lecturing	Written exam	
	2.7	Physiology Brain stem control of motor function	-Explain the neural pathways and nuclei within the brain stem involved in motor control, and their contributions to motor coordination and reflex responses.	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	
	2.8	Microbiology Acute bacterial meningitis: epidemiology, presentation, and defenses against infection	Understanding of acute bacterial meningitis: epidemiology and presentation	K	Face to face		Synchronous Lecturing	Written exam	: Harrison's Infectious Diseases 3rd Edition. SECTION III Infections in organ systems. Chapter 33.
	2.9	Pharmacology Antidepressants	1. Define some types of anxiety and insomnia disorders 2. Classify types of drugs used for treatment of anxiety and insomnia 3. Discuss the different characteristics of hypnotic antianxiety drugs	K C K	Face to face		Synchronous Lecturing	Written exam	
	2.10	Behavior Neurochemistry	1. Understand the types of neurotransmitters 2. Understand the individual neurotransmitters and their role in human psychology and mental illness	C C	Face to face		Synchronous Lecturing	Written exam	Slides
	2.11	Behavior Individual Differences (Intelligence)	1. Understand the definition of intelligence 2. Understand the different ways of studying intelligence	C C	Face to face		Synchronous Lecturing	Written exam	Slides
Week	**Lecture**	**Topic**	**Student Learning Outcome (SLO)**	**Descriptors ****	**Learning Methods (Face to Face/Blended/ Fully**	**Platform**	**Synchronous / Asynchronous Lecturing**	**Evaluation Methods**	**Resources**
3	3.1	Anatomy Anatomy of the Diencephalon	*Identify different parts of the diencephalon. *Describe parts and relations of the thalamus,	K	Face to face		Synchronous Lecturing	Written exam	28-8

			nuclei and functions of the hypothalamus, parts and function of the epithalamus and nuclei of rhe subthalamus and metathalamus. * Recognize clicical syndromes resulted from each part lesion	K C					
	3.2	Anatomy Anatomy of the Cerebellum	*Describe lobes, fissures, vertical and horizontal classification of the cerebellum. *Specify different histological layers of cerebellar cortex, cells, tracts and connection between each. *Explain different tracts of each cerebellar peduncle and function of each. *Recognize lesions resulted from cerebellar dysfunction (Ataxia)	K K C	Face to face		Synchronous Lecturing	Written exam	28-8
	3.3	Anatomy Blood supply of different parts of the nervous system	*Outline internal carotid and vertebrobasilar systems and anatomical areas supplied by each. *Describe circulus areriosus and its clinical significance. *Relate blood supply of different parts of the nervous system and their resulted lesions. *Distinguish between different types of brain hemorrhage, sites, causes and their clinical manifestations.	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-8
	3.4	Pathology Myelin diseases of the PNS	1. Compare diseases of myelin in the CNS and PNS. 2. List causes of demyelinating diseases in the PNS. 3. Describe the pathogenesis of Gillian Barrie syndrome. 4. Describe the pathogenesis and symptoms of diabetic neuropathy.	S	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	
	3.5	Pathology Neurodegenerative diseases 1	1: describe neurodegenerative diseases affecting cerebral cortex known as dementias including Alzheimer disease, frontotemporal dementia and pick disease and the differences between them in pathogenesis,	K	Face to face		Synchronous Lecturing	Written exam	

			morphology and clinical features.						
	3.6	Biochemistry Neurotransmitters	Understand the different classes of neurotransmitters and their biochemical synthesis and regulation	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	On lin e 1. Mark's Basic Medical Biochemistry, 7th ed. 2023. 2. http://what-whenhow.com/neuroscience/neurotransmitters-the-neuron-part-1/ K Final exam synthesis and its reg
	3.7	Microbiology	Understanding of acute and chronic bacterial meningitis: diagnostic approaches and management	K	Bended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	Harrison's Infectious Diseases 3rd Edition. SECTION III Infections in organ systems. Chapter 33. G
	3.8	Physiology Basal nuclei control of motor function	-Explain the neural circuitry and pathways within the basal ganglia and their connections with the cortex, thalamus, and brain stem involved in regulating voluntary motor movements and action selection. -Describe the neurotransmitter systems and their influence on motor function. -Apply knowledge of basal ganglia control of motor function to diagnose and manage neurological conditions affecting motor control.	K K C	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	
	3.9	Physiology Cerebellar control of motor function	-Explain the role of cerebellum in motor function. -Describe cerebellar circuitry and its contribution to modulating and refining motor commands. -Perform neurological assessments to evaluate motor skills affected by cerebellar dysfunction.	K K S	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	
	3.10	Pharmacology Antipsychotic	1. Define some types of anxiety and insomnia disorders	K	Face to face		Synchronous Lecturing	Written exam	

Week	Lecture	Topic	Student Learning Outcome (SLO)	Descriptors **	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
			2. Classify types of drugs used for treatment of anxiety and insomnia						
	3.11	Pharmacology Antipsychotic	3. Discuss the different characteristics of hypnotic antianxiety drugs	K	Face to face		Synchronous Lecturing	Written exam	
	3.12	Behavior Individual Differences (Personality)	1. Understand the definition of personality 2. Understand the different ways of studying personality	C C	Face to face		Synchronous Lecturing	Written exam	Slides
	3.13	Behavior Stress	1. Understand the definition of stress in psychological terms 2. Understand the different individual responses to stress 3. Understand the different physiological changes in response to stress	C C C	Face to face		Synchronous Lecturing	Written exam	Slides
4	4.1	Anatomy Embryology of different parts of the nervous system	*Arrange different parts of the neural tube and the parts developed from each brain vesicle. *Discriminate congenital anomalies of different parts of the nervous system.	K E	Blended		Asynchronous Lecturing	Written exam/ Online activities and assignments	28-8
	4.2	Pathology Neurodegenerative diseases 2	recognize the neurodegenerative diseases affecting the basal ganglia known as movement disorders including Parkinson and Huntington diseases and discussing pathogenesis, morphology, and clinical features.	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	
	4.3	Pathology Neurodegenerative diseases 3 and metabolic disturbances	recognize the neurodegenerative diseases affecting the cerebellum and motor system including SPINOCEREBELLAR ATAXIA, Friedrich ataxia, ataxia telangectasia and amyotrophic lateral sclerosis, discussing pathogenesis, morphology, and clinical features. Discuss few metabolic and toxic neurologic disturbances and their clinical importance	S	Face to face		Ssynchronous Lecturing	Written exam	
	4.4	Physiology Spinal cord	-Explain the basic neurophysiological principles underlying	K	Face to face		Synchronous Lecturing	Written exam	

			sensory processing, integration, and motor output within the spinal cord, including reflex arcs and spinal cord-mediated control of locomotion. -Apply knowledge of spinal cord neurophysiology to diagnose and manage neurological conditions affecting spinal cord function.	C					
	4.5	Physiology Cortical sensory areas	Explain the principles of sensory perception and cortical representation of sensory modalities. -Perform sensory examination to assess different modalities of sensation to detect abnormalities related to sensory function	K	Face to face		Synchronous Lecturing	Written exam	
	4.6	Pharmacology Antipsychotic	• Define some type of antipsychotics in treating major depressive disorder • Compare the risks and benefits of the antipsychotics covered	K C	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	
	4.7	Pharmocology Antipsychotic	• Apply presented data and clinical pearls to patient case	C	Face to face		Synchronous Lecturing	Written exam/ Online activities and assignments	

Week	Lecture	Topic	Student Learning Outcome (SLO)	Descriptors **	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
5	5.1	Anatomy Introduction to spinal cord	1.Identify the location and gross features of spinal cord. 2. Describe the meninges and spaces surrounding spinal cord. 3. Recognise most common sites of Disc Herniation 4. Explain major symptoms and causes of Disc Herniation.	K C K	Face to face		Synchronous Lecturing	Written exam	28-8
	5.2	Anatomy Ascending tracts 1	* 1. Describe the anatomical organization of the Ascending tracts. 2. Illustrate the functions of ascending tracts in pain, temperature, touch and pressure sensation (ALS)	K	Face to face		Synchronous Lecturing	Written exam	28-8
	5.3	Anatomy Ascending tracts 2	1. Illustrate the functions of ascending tracts in Proprioception (PCML) and spinocerebellar tracts	K	Face to face		synchronous Lecturing	Written exam/	28-8

		2. Define the major clinical manifestations of injuries affecting ascending tracts						
5.4	Anatomy Descending tracts	1. Describe the anatomical organization of the Descending tracts. 2. Illustrate the function of descending tracts in different body movements 3. Define the major clinical manifestations of injuries affecting descending tracts. 4. Explain major symptoms and causes of both upper and lower motor neuron lesions	K	Face to face		synchronous Lecturing	Written exam/	28-8
5.5	Pathology Intoduction to CNS tumours	Recognize the CNS tumors characteristics, grading system, and the WHO classification and discuss the role of the tumor genotype in the diagnosis and outcome.	K	Face to face		Synchronous Lecturing	Written exam	
5.6	Pathology Glial tumours	Recognize and compare the main characteristics of the different grades of astrocytoma and oligodendrogliomas.	K S	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	
5.7	Physiology Somatic sensations Tactile sensations	-Define the neurophysiological mechanisms involved in tactile sensation. -Describe the neural pathways involved in relaying tactile information to the somatosensory cortex	K K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	
5.8	Physiology Somatic sensations Thermal and proprioceptive sensations	. Define the neurophysiological mechanisms involved in thermal sensation. - Describe the neurophysiological mechanisms involved in proprioception.	K K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	
5.9	Physiology Pain sensation	-Define the neurophysiological mechanisms involved in pain sensation. -Perform pain assessments to evaluate pain intensity, quality, and localization in individuals with acute or chronic pain conditions.	K S	Face to face		Synchronous Lecturing	Written exam	
5.10	Behavior Learning	1. Understand the types of learning	C C	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	Slides

			2. Understand the different methods of learning						

Week	Lecture	Topic	Student Learning Outcome (SLO)	Descriptors **	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	
6	6.1	Anatomy Blood supply and lesions of spinal cord	1. Describe the blood supply and venous drainage of spinal cord 2. Explain major symptoms and causes of vascular lesions of the spinal cord	K C K	Blended	Moodle	ASynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	28-8
	6.2	Anatomy Brain stem 1	* Recognise the general external features for each part of the brainstem. 2. Distinguish different structures in a cross sections of Medulla Oblongata at different levels relate these to the external features. 3. Discuss the paths taken by the major ascending and descending tracts and recognize associated brainstem nuclei in medulla Oblongata	K	Face to face		Synchronous Lecturing	Written exam	28-8
	6.3	Anatomy Brain stem 2	1. Distinguish different structures in a cross sections of pons at different levels relate these to the external features. 2. Discuss the paths taken by the major ascending and descending tracts and recognize associated brainstem nuclei in pons	K	Face to face		synchronous Lecturing	Written exam	28-8
	6.4	Anatomy Brain stem 3	1. Distinguish different structures in a cross sections of midbrain at different levels relate these to the external features. 2. Discuss the paths taken by the major ascending and descending tracts and recognize associated brainstem nuclei in midbrain	K	Face to face		synchronous Lecturing	Written exam	28-8
	6.5	Pathology neuronal and	discuss and compare the main characteristic features	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities	Brat, D. J. (2021). *WHO*

	embryonal tumors	of neuronal and embryonal tumors recognize other tumors that involves the CNS	S				and assignments/ Discussion session	*classification of tumours.* International Agency for Research on Cancer (IARC).
6. 6	Physiology Vision	-Define the neurophysiological mechanisms underlying vision, including refraction, visual perception, transduction of light, and transmission of information from the retina to visual cortex.	K	Face to face		Synchronous Lecturing	Written exam	
6.7	Physiology Vision	Describe the neural pathways involved in visual information processing.	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	
6.8	Physiology Vision	Perform visual examinations to assess visual acuity, visual field defects, color vision, and visual perception to identify abnormalities related to visual function.	S	Face to face		Synchronous Lecturing	Written exam	
6.9	Microbiology	Understanding of viral meningitis and encephalitis: epidemiology, presentation, diagnostic approaches, and management.	C	Face to face		Synchronous Lecturing	Written exam	Harrison's Infectious Diseases 3rd Edition. SECTION III Infections in organ systems. Chapter 33.
6.10	Pharmacolog y Opioid analgesics	1. Discriminate between types of pain 2. Identify different types of opioids	C K	Face to face		Synchronous Lecturing	Written exam	
6.11	Pharmacolog y Opioid analgesics	3. Discuss the different characteristics of opioids	C	Face to face		Synchronous Lecturing	Written exam	
6.12	Behavior Memory	1. Understand the different types of memory 2. Understand the methods to improve memory 3. Understand how we forget	C C C	Face to face		Synchronous Lecturing	Written exam	Slides
6.13	Behavior Eating	1. Understand hunger regulation in the brain 2. Understand the factors that influence eating behavior	C C	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	Slides
6.14	Biochemistry Stem cells and neurodegener ative diseases	1. Develop basic knowledge about stem cells. 2. Understand the idea and ethics behind using stem cells as a treatment strategy for neurodegenerative diseases	K C	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments/ Discussion session	Slides

25. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Descriptors**	Period (Week)	Platform
Midterm exam	40	Anatomy, physiology, biochemistry pathology, pharmacology, microbiology and behavior	All until the midterm exam (4th week)	K S C	End of 4th week	Exambuilder
Online assignments, activities and discipline	5	All blended topics	All blended topics	K S C	1st- 7h week	Moodle
Practical	15	Anatomy, Physiology, Pathology	To be announced later	K C S	End of 4th and 7th week	Exambuilder
Final exam	40	Anatomy, physiology, biochemistry pathology, pharmacology, microbiology behavior clinical, and practical	All starting from 5th week until the end of 8th week	K S C	End of 8th week	Exambuilder
** K: Knowledge, S: Skills, C: Competency						

The University of Jordan الجامعة الاردنية

* According to the instructions for granting a Bachelor's degree.

**According to the principles of organizing semester work, tests, examinations, and grades for the bachelor's degree.

Mid-term exam specifications table*

(Tables below are completed on separate forms by course coordinators prior to conduction of each exam according to Accreditation and Quality Assurance Centre procedures and forms)

No. of questions/ cognitive level						No. of questions per CLO	Total exam mark		Total no. of questions	CLO/ Weight	CLO no.
Create %10	Evaluate %10	analyse %10	Apply %20	Understand %20	Remember %30						
1	1	1	1	1	2	7	44		44	16%	1
1	1	1	1	1	2	7				16%	2
1	1	1	1	1	1	6				13.6%	3
1	1	1	1	1	1	6				13.6%	4
1	1	1	1	1	1	6				13.6%	5
1	1	1	1	1	1	6				13.6%	6
1	1	1	1	1	1	6				13.6%	7

Final exam specifications table

No. of questions/ cognitive level						No. of questions per CLO	Total exam mark	Total no. of questions	CLO Weight	CLO no.
Create %10	Evaluate %10	analyse %10	Apply %20	Understand %20	Remember %30					
1	1	1	1	2	2	8	56	56	14.3%	1
1	1	1	1	2	2	8			14.3%	2
1	1	1	1	2	2	8			14.3%	3
1	1	1	1	2	2	8			14.3%	4
1	1	1	1	2	2	8			14.3%	5
1	1	1	1	2	2	8			14.3%	6
1	1	1	1	2	2	8			14.3%	7

26. Course Requirements:

(e.g.: students should have a computer, internet connection, webcam, account on a specific software/platform…etc.):

- ✓ **Class room Lectures**
- ✓ **Internet connection**
- ✓ **Online educational material using Moodle (Electronic Videos and Activities)**

Histology and physiology Lab sessions

27. Course Policies:

A- Attendance policies:

Attendance will be monitored by the course coordinator. Attendance policies will be announced at the beginning of the course.

B- Absences from exams and handing in assignments on time:

Will be managed according to the University of Jordan regulations. Refer to http://registration.ju.edu.jo/Documents/daleel.pdf

C- Health and safety procedures:

Faculty Members and students must at all times, conform to Health and Safety rules and procedures.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this course and also integrity in your behavior in and out of the classroom. Students violate this policy would be subjected to disciplinary action according to University of Jordan disciplinary policies

E- Grading policy:

Grade-point average, Rules are preset by the Faculty and Department Councils

F- Available university services that support achievement in the course:

Availability of comfortable lecture halls, data show, internet service and E learning website https://elearning.ju.edu.jo/ .

28. References:

A- Required book (s), assigned reading and audio-visuals:

1) Guyton and Hall Textbook of medical physiology, 13th edition, Hall. (Physiology)

2) Ganong's review of medical physiology, 25th edition. Barrett, Barman, Boitano, Brooks. (Physiology)

3) Biochemistry (Lippincott illustrated reviews series) 6th edition, Farrier.
Cecerska-Heryć, E., Pękała, M., Serwin, N. et al. The Use of Stem Cells as a Potential Treatment Method for Selected Neurodegenerative Diseases: Review. Cell Mol Neurobiol 43, 2643–2673 (2023). https://doi.org/10.1007/s10 571-023-01344-6 (Biochemistry)

4) Basic clinical parasitology. F. A. Neva & H.W. Brown. Prentice Hall International Editions. (Microbiology)

5) Harrison's Infectious Diseases 3rd Edition. SECTION III Infections in organ systems. Chapter 33. (Microbiology)

6.) A. Robbins & Cotran Pathologic Basis of Disease, 0th edition, Kumar, Abbas, Aster (Pathology)

7.) B. Brat, D. J. (2021). WHO classification of tumours. International Agency for Research on Cancer (IARC). (Pathology)

8) Basic and Clinical Pharmacology, 13th edition, Katzung, Trevor. (Pharmacology)

9) Snell Clinical Neuroanatomy 9th Edition, Richard Snell. (Anatomy):

Name of the Instructor or the Course Coordinator: Dr. Diala Abu Hassan	Signature:	Date: 1/7/2025
Name of the Head of Quality Assurance Committee/ Department Dr. Enas Al-Zayadneh	Signature:	Date: 11/5/2025
Name of the Head of Quality Assurance Committee/ School or Center Professor Ayman Wahbeh	Signature:	Date: 10/7/2025
Name of the Dean or the Director Professor Ayman Wahbeh	Signature:	Date: [illegible]/7/2025

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