كلية الطب

Faculty of Medicine

الجامعـــة الهاشميـــة

The Hashemite University

Syllabus: Neuroscience (0111501305)
Second Semester 2025 /2026

COURSE INFORMATION	
Course Name: Neuroscience **Semester:** Second **Department:** Department of Anatomy, Physiology, and Biochemistry **Faculty:** Faculty of Medicine	**Course Code:** 0111501305 **Section:** All **Core Curriculum**: MD Program
Day(s) and Time(s): TBD **Classrooms:** Lectures: TBD Labs: TBD	**Credit Hours:** 4 **Prerequisites**: None

COURSE DESCRIPTION

The Neuroscience I (CNS) module is an intensive, multidisciplinary integrated 4 credit hour course designed to provide students with the basic sciences and clinical framework for topics of the central nervous system. The course is designed to assist the student in integrating the different disciplines' lectures and practical sessions in each part of the system, including anatomy, physiology, pathology, pharmacology, biochemistry, and community medicine.

DELIVERY METHODS

The course will be delivered through a combination of active learning strategies. These will include:

- PowerPoint lectures and active classroom-based discussion
- Collaborative learning through integrated case studies
- Relevant papers and reading materials.
- E-learning resources: e-reading assignments and practice quizzes through Microsoft Team

FACULTY INFORMATION

Course Coordinator & Biochemistry Lecturer	
Name:	**Nebras Yahya Melhem**

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INSTRUCTORS	
Anatomy Lecturers	
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Pathology Lecturer	
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Pharmacology Lecturer	
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Community Medicine Lecturer	

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Clinical Sessions Lecturer	
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Office Hours:	N/A

REFERENCES AND LEARNING RESOURCES

Physiology:

- Guyton and Hall Textbook of Medical Physiology 14th Edition (Elsevier 2020)
- Neuroscience 6th edition, Purves et al. (Oxford University Press 2017)

Anatomy:

- Principle of Human Anatomy. By Gerard J. Tortora, Mark Nielsen - 15th Edition (Wiley 2020)
- Snell's Clinical Neuroanatomy. By Ryan Splittgerber – 8th Edition (Wolters Kluwer).

Pathology:

- Robbins Basic pathology 10th Edition (Elsevier 2018)
- Web Pathology and Supplementary Handouts

Pharmacology:

- Lippincott Illustrated Reviews: Pharmacology (Lippincott Illustrated Reviews Series) 7th edition (2018)

Biochemistry:

- Harper's Illustrated Biochemistry (McGraw-Hill Education / Medical; 31st edition (May 28, 2018).
- Thomas M. Devlin. Textbook of Biochemistry with Clinical Correlations (John Wiley & Sons; 7th edition

Community Medicine:

- Buse DC, Reed ML, Fanning KM, et al. Comorbid and co-occurring conditions in migraine and associated risk of increasing headache pain intensity and headache frequency: results of the Migraine in America Symptoms and Treatment (MAST) study. J Headache Pain 2020; 21 (1): 23.
- GBD 2017 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet 2018; 392 (10159): 1789–1858.

STUDENT LEARNING OUTCOMES MATRIX

COURSE STUDENT LEARNING OUTCOMES

TOPIC	COURSE	SUBJECT	INTENDED LEARNING OUTCOMES

Topic 1. Introduction	**ANATOMY LECTURE 1**	An introduction to the nervous system.	Review the structure of the central, peripheral & autonomic nervous systems.
	BIOCHEMISTRY LECTURE 1 & 2	Biochemistry of CNS neurotransmitters.	1. Define neurotransmitters and classify their chemical nature. 2. Illustrate steps of Catecholamines Synthesis and Catabolism 3.Illustrate Steps of Histamine and Serotonin Synthesis and inactivation 4.Explain how glutamate is synthesized in the neurons from local precursors 5.Describe the glutamate-glutamine cycle in the brain 6.Define excitotoxicity and explain its mechanism 7.Illustrate steps of GABA (γ-Aminobutyric acid) Synthesis and Catabolism.
	PHARMACOLOGY LECTURE 1	Drugs and synaptic transmission.	1. Revise basic concepts of action potential, synaptic transmission, major neurotransmitters of the CNS, and the neurotransmitter's cycle 2. Understand the main differences between Excitatory Postsynaptic Potentials (EPSP) and Inhibitory Postsynaptic Potentials (IPSP) 3. Recall major CNS receptors implicated in the actions of most commonly used drugs 4. Familiarize with the principal drug targets in the treatment of CNS disorders
	PATHOLOGY LECTURE 1	Markers of neuronal injury, edema, herniation, and hydrocephalus.	1. Understand the markers of neuronal injury and the pathogenesis of edema, herniation, and hydrocephalus. 2. Describe the patterns of injury & responses to injury in the nervous system. 3. Describe the underlying mechanisms, causes, gross features of cerebral edema 4. Define the subfalcine (cingulate), transtentorial (uncinate), & the tonsillar hernias & describe the effects of each one.
Topic 2. Spinal cord & Somatic Sensations	**ANATOMY LECTURE 2,3,4**	The spinal cord: Gross features & Internal structure. Ascending tracts of the spinal cord & descending tracts of the spinal cord.	1. Describe the gross and internal features of the spinal cord. 2. Describe the arrangements of nerve fiber tracts in the spinal cord. 3. Describe the anterolateral ascending tracts. 4. Describe the dorsal column tracts. 5. Describe the muscle-joint pathway to the cerebellum 6. Describe the spinotectal, spinoreticular, spino- Olivary, and visceral sensory tracts. 7. Identify the different direct and indirect ascending tracts in the spinal cord.

			8. Describe the pyramidal and extra-pyramidal tracts and their functions. 9. Describe the intersegmental tracts and their significance.
	PHYSIOLOGY LECTURE 1, 2, 3, 4, 5	Sensory nervous system & dorsal column sensations spinothalamic sensations & pain control & spinal reflexes.	1. Understand sensory receptors (generator potential, specificity, adaptation) 2. Define sensory unit and receptive field 3. Describe the coding of sensory information (modality, locality, intensity). 4. Identify modalities of sensations transmitted by the dorsal column and spinothalamic pathways. Differentiate protopathic and epicritic sensations 5. Understand pain classifications, central perception, referred pain, headache, pain modulation by cns: gate theory & descending analgesia system, stress analgesia. 6. Differentiate monosynaptic (stretch reflex) and polysynaptic spinal reflexes. 7. Understand static and dynamic stretch reflex and apply the knowledge to muscle tone and tendon jerk. 8. Describe supraspinal control of stretch reflex and alpha gamma coactivation. 9. Describe inverse stretch reflex (muscle tension versus muscle length homeostasis)

	PHARMACOLOGY **LECTURE 2, 3**	Opioids and opioid antagonists	1. Describe the different types of opioid receptors, the primary endogenous opioids that activate them, and their distribution in the CNS. 2. Understand the main signaling pathways associated with the activation of each opioid receptor and the resulting effects. 3. Describe the most commonly used opioids based on their nature (natural, synthetic, or semi-synthetic) or pharmacodynamic properties (agonists, partial agonists, or antagonists). 4. Describe the mechanism of action, actions, therapeutic uses, adverse effects, and main contraindications of morphine. 5. Compare the pharmacological characteristics of other opioid agonists with morphine and familiarize with the major differences. 6. List the main opioid mixed agonist-antagonists and describe their uses as analgesics and for the treatment of opioid use disorder. 7. Understand the mechanism of action of opioid receptor antagonists and their use for the treatment of opioid overdose and opioid use disorder.
TOPIC 3. **BRAIN STEM**	**ANATOMY** **LECTURE 5,6, 7**	The Brainstem: Medulla, oblongata, pons, and Midbrain Cranial nerves	1. Describe the structure, functions, and components of the brainstem. 2. Describe the external and internal features of the upper, middle, and lower levels of the medulla oblongata. 3. Describe the external & internal features of the pons. 4. Describe the external & internal features of the midbrain. 5. Describe the red nucleus & its connections. 6. Describe the different lemnisci. 7. List the cranial nerves i–xii. 8. List the functional components of cranial nerves. 9. Describe the motor, sensory, and parasympathetic nuclei of the cranial nerves i–xii and their connections.
	PHYSIOLOGY **LECTURE 6**	The Reticular Formation	1. Describe the sensory part of the reticular formation 2. Describe the motor part of the reticular formation 3. Understand the ascending reticular activating system {ARAS} function, identify factors affecting the activity of ARAS
TOPIC 4. **Cerebellum**	**ANATOMY** **LECTURE 8**	The Cerebellum	1. Describe the cerebellum; its external and internal features, including the

			intracerebellar nuclei. 2. Describe the functional areas of the cerebellar cortex and its white matter. 3. Describe the afferent & efferent connections of the cerebellum. 4. Review the signs and symptoms of cerebellar diseases related to its anatomy.
	PHYSIOLOGY **LECTURE 7 & 8**	Cerebellum & Neocerebellar syndrome	1. Identify Cerebellar neuronal circuits (mossy and climbing fibers) 2. Describe the Functions of the cerebellum 3. Apply the basic knowledge to the manifestations of Neocerebellar syndrome 4. Understand the Nervous control of voluntary movement (planning, execution)
TOPIC 5. **Limbic system and Basal Ganglia &Diencephalon**	**ANATOMY** **LECTURE 9, 10**	The Limbic system and Basal Ganglia, Thalamus, epithalamus, subthalamus, hypothalamus	1.Describe the limbic system, the structures forming it, its functions and connections 2.Describe the components of basal nuclei, their functions, afferent and efferent connections, and disorders 3.Describe the thalamus, the thalamic nuclei, their functions, and connections 4.Describe the epithalamus, its parts, connections, and functions 5.Describe the subthalamus 6.Describe the hypothalamus, hypothalamic nuclei, and hypothalamic lines of communications, afferent and different connections 7.Review the functions of the hypothalamus
	PHYSIOLOGY **LECTURE 9 & 10**	• Basal Ganglia circuits and Papez circuits, Diencephalon • Memory and learning	1.Identify the Connections of the basal ganglia (cortical, brain stem, interconnections within the basal ganglia) 2.Understand the functions of the Basal Ganglia 3.List the Diseases of the basal ganglia (PD, chorea, athetosis, hemiballismus) 4.Describe Release Phenomena in CNS, rigidity 5.Identify the Connections of the limbic system (between its different parts, Papez circuit), and understand functions of the limbic system 6.Define Synaptic Plasticity and recognize its different forms (Potentiation, depression, sensitization) 7.Describe types of Memory: mechanism, consolidation, encoding 8.Compare associative against non-associative learning 9.Describe Thalamus functions and apply the knowledge to the manifestations of the thalamic

			syndrome 10.Understand the Hypothalamus functions and define fear and rage
	PHARMACOLOGY LECTURE 4, 5, 6	• CNS stimulants & drugs of abuse. • Pharmacology: antidepressants, Drug therapy for PD and AD • Antipsychotic drugs	1. Define terminology related to substance abuse, including addiction, dependence, tolerance, and withdrawal 2. Differentiate between psychological and physical dependence 3. Describe the mechanisms of action of CNS stimulants and their major adverse effects 4. Describe the abuse potential of amphetamines and cocaine 5. Familiarize with the diagnostic criteria for major depressive disorder and bipolar disorder 6. Revise the monoamine theory and norepinephrine and serotonin signaling in the CNS 7. Recognize the major categories of the currently utilized antidepressants 8. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of selective serotonin reuptake inhibitors (SSRIs) 9. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of serotonin-norepinephrine reuptake inhibitors (SNRIs) 10. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of tricyclic antidepressants (TCAs) 11. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug and food-drug interactions of monoamine oxidase inhibitors (MAOIs) 12. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of atypical antidepressants 13. Familiarize with up-to-date therapies of depression, including serotonin dopamine activity modulators and NMDA antagonists 14. Understand the role of lithium and mood stabilizers in the treatment of bipolar disease 15. Revise pharmacologically relevant concepts in the pathogenesis of Parkinson's Disease and Alzheimer's

			Disease 16. Understand the fundamental therapeutic strategies of Parkinson's Disease 17. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of Levodopa+carbidopa 18. Define the concepts of "wearing off" "on-off" phenomena and pharmacological approaches to reduce their occurrence 19. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of catechol-O-methyltransferase inhibitors (COMTIs) 20. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of selective MAOIs 21. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of dopamine receptor agonists 22. Describe the therapeutic advantage of using antimuscarinic agents for the treatment of Parkinson's disease 23. Describe the basic principles of the pharmacological treatment of Alzheimer's Disease 24. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of acetylcholinesterase inhibitors and NMDA antagonists used for the treatment of Alzheimer's Disease 25. Familiarize with the currently investigated disease-modifying agents in the treatment of Alzheimer's Disease 26. Familiarize with basic definitions related to psychotic disorders such as delusions and hallucinations, and relate to relevant causes of psychosis 27. Revise potential mechanisms involved in the pathogenesis of schizophrenia, including the dopamine hypothesis 28. Understand major differences in signaling and effects of different dopamine receptors 29. Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects,

			and drug-drug interactions of typical and atypical antipsychotics
	PATHOLOGY **LECTURE 2**	Degenerative diseases and Dementia including: Parkinsonism, Alzheimer's disease, Huntington Disease	1. Enumerate the major causes of dementia 2. Describe the incidence, causes, pathogenesis, clinical features, gross & microscopic features (neuritic plaques & neurofibrillary tangles) of Alzheimer disease 3. Define parkinsonism & enumerate its causes
TOPIC 6. Cerebral Cortex & Electrical activity of the brain	**ANATOMY** **LECTURE 11 & 12**	Cortical areas + functional significance	1. Describe the different lobes, sulci & gyri of cerebral hemispheres 2. Describe the functional localization of the cerebral cortex and their clinical significance
	PHYSIOLOGY **LECTURE 11 & 12**	Electrical activity of the brain, EEG & sleep	1. Identify the electrical activity of the brain (evoked potentials, spontaneous potentials) 2. List different EEG waves, frequency, and physiological significance 3. Describe the physiological changes during sleep, types of sleep, mechanisms of sleep, sleep disturbances
	PHARMACOLOGY **LECTURE 7, 8, 9**	Pharmacology of sedative hypnotics General anesthetics Drug used in epilepsy	1.Understand transmission at the GABAergic synapse 2.Understand the GABA-A receptor signaling pathway 3.Understand the mechanism of action, therapeutic indications, pharmacokinetics, adverse effects, and drug-drug interactions of benzodiazepines 4.Recognize the role of flumazenil in the treatment of benzodiazepine overdose 5.Describe the differences between the action of benzodiazepines and barbiturates on GABA receptors 6.Understand major effects, phases, benefits, and optimal selection of general anesthesia 7.Describe the characteristics of the ideal general anesthetic 8.Differentiate between the main characteristics of intravenous anesthetics 9.List the currently utilized inhalational anesthetics, their possible mechanisms of action, and their role in the maintenance of anesthesia 10.Define minimal alveolar concentration (MAC) and its affecting factors 11.Differentiate between various inhalational anesthetics and their pharmacological characteristics 12.Know the role of dantrolene as an antidote against malignant hyperthermia 13.List drugs used as adjuncts to general anesthesia 14.Define key definitions such as convulsions, seizures, and epilepsy

			15.List the cause of seizures 16.Understand the clinical classification of seizures 17.Identify the major mechanisms of action of different antiepileptics 18.Differentiate between the clinical uses, pharmacokinetics, adverse reactions, and drug-drug interactions of the most commonly used antiepileptics 19.Describe the use of antiepileptics during pregnancy
TOPIC 7. TRAUMATIC BRAIN INJURY	**PATHOLOGY LECTURE 3**	CNS TRAUMA	1.Describe the sites, gross & microscopic features of recent & old; closed & opened traumatic head injury 2.Describe the cause, pathologic features, & effects of diffuse axonal injury 3.Describe the causes, sites & effects of traumatic: (1) epidural hemorrhages (2) subdural hemorrhages (acute & chronic)
TOPIC 8. VASCULAR DISORDERS	**ANATOMY LECTURE 13**	Blood supply of the brain and spinal cord	1.Describe the arterial blood supply of the brain 2.Describe the circle of Willis 3.Describe the veins of the brain
	PATHOLOGY LECTURE 4	Cerebrovascular diseases	1.Define the term cerebrovascular disease (thrombotic & embolic occlusion of vessels & vascular rupture) 2.Describe the causes, gross & microscopic (early, subacute, & repair) changes, & outcomes of global cerebral ischemia 3.Enumerate the sources of cerebral emboli 4.Describe the sites, types, gross & microscopic changes of early & late cerebral infarction, and classify the intracranial hemorrhages 5.Describe the causes, sites, effects, gross & microscopic features of primary brain parenchymal hemorrhage, subarachnoid hemorrhage 6.Describe the pathologic features of berry saccular aneurysms & vascular malformations 7.Describe the effects of hypertensive cerebrovascular disease
TOPIC 9. VENTRICLES OF THE BRAIN	**ANATOMY LECTURE 14**	Ventricles of the Brain, Dural folds, CSF	1. Describe the dura, arachnoid, and pia mater of the brain & spinal cord. 2. Describe the dural folds. 3. Describe the dural venous sinuses. 4. Describe the lateral ventricles, third ventricle, cerebral aqueduct, fourth ventricle. 5. Describe the white matter of the brain, the commissural, association, and projection fibers.
TOPIC 10. EPIDEMIOLOGY & CLINICAL PERSPECTIVES	**CLINICAL SESSION LECTURE 1 & 2**	Introduction to Physical examination and localization of Central nervous system disorders.	**Session I:** 1. Understand Focal vs Generalized Neurological Deficits

			2. Differentiation between consciousness and cognition. 3. Describe Glasgow Coma Scale (GCS) and Mini-Mental State Exam (MMSE) as tools to assess Consciousness and cognition. 4. Define Delirium and dementia, understand the differences in causes and General Management. **Session II:** 1. Describe the different clinical examination findings between nerve root, spinal cord and Brain Pathologies. 2. Describe differences between spasticity and rigidity. 3. Differentiate pyramidal from extrapyramidal motor diseases. 4. Describe spinal cord syndromes and their clinical findings.
	COMMUNITY MEDICINE LECTURE 1	Prevalence and risk factors of Migraine and common neurodegenerative diseases	1. Prevalence and risk factors of migraine 2. prevalence and risk factors of other neuro-diseases.
PRACTICAL SESSIONS (LABS)			
LABS	**ANATOMY LAB 1 & 2**	1. To identify the different lobes and poles of cerebral hemispheres. 2. To identify the different sulci & gyri of the cerebral hemispheres. 3. To localize the important blood vessels of the brain. 4. To identify the different parts of brain stem & its important landmarks 5. To identify the different parts seen in the sagittal section of the brain. 6. To localize the different parts seen in the transverse section of the cerebral hemisphere. 7. To identify the different dural folds.	
	PHYSIOLOGY LAB 1	1. Examination of Somatic Sensations& Sensory lessons. 2. Recordings of PowerLab system (Myotatic reflex/EEG).	1. Understand steps, and precautions during the examination of the somatic sensations. 2. Identify common sensory lesions.
	PATHOLOGY LAB 1	The student should be able to identify, describe and diagnose the common and the important pathological lesions of the various CNS disorders given.	
COURSE OBJECTIVES			
BIOMEDICAL OBJECTIVES	1. Describe the Structure of different parts of the CNS, their development, and blood supply. 2. Understand the different mechanisms, circuits, and pathways responsible for the normal function of the CNS. 3. Identify the abnormalities in CNS structure and function, which occur in diseases and understand the pathogenies and etiology of CNS diseases 4. Understand the use, efficiency, and interactions of different drugs for common CNS diseases. 5. Describe the epidemiology and public health issues of common CNS illnesses in the community 6. Correlate the basic biomedical knowledge to the clinical skills		
CRITICAL THINKING	1. Observe, identify and predict health problems based on previous experience and make decisions based on evidence rather than opinion 2. Draw conclusions about the collected data (inference). 3. Maintain good communication habits, such as active listening and respect. 4. Improve problem-solving skills. 5. Demonstrate knowledge of resources and tools available to support lifelong learning.		
ASSESSMENT METHOD			
Exams & online' reading assignments, quizzes.			

ACADEMIC SUPPORT

It is The Hashemite University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate for individual's needs.

Special Needs Section: Student Services and Care Unit
Tel: 053903333 ext. 4132 / 4583 / 5023
Location: Deanship of Students Affairs
Email: student@hu.edu.jo

COURSE REGULATIONS

- **Participation**

Class participation and attendance are important elements of every student's learning experience at The Hashemite University, and the student is expected to attend all classes.

- A student should not miss more than 15% of the classes during a semester.
- *Those exceeding this limit of 15% will receive a failing grade regardless of their performance*.

It is a student's responsibility to monitor the frequency of their own absences. **Attendance record begins on the first day of class irrespective of the period allotted to drop/add and late registration. It is a student's responsibility to sign-in; failure to do so will result in non-attendance being recorded.**

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a class provided that the number of such occasions does not exceed the limit allowed by the University. The instructor will determine the acceptability of an absence for being absent. A student who misses more than 25% of classes and has a valid excuse for being absent will be allowed to withdraw from the course.

- **Plagiarism**

Plagiarism is considered a serious academic offence and can result in your work losing marks or being failed. The Hashemite University expects its students to adopt and abide by the highest standards of conduct in their interaction with their professors, peers, and the wider University community. As such, a student is expected not to engage in behaviors that compromise his/her own integrity as well as that of the Hashemite University.

Plagiarism includes the following examples, and it applies to all student assignments or submitted work:

- **Use of the work, ideas, images or words of someone else without his/her permission or reference to them.**
- **Use of someone else's wording, name, phrase, sentence, paragraph or essay without using quotation marks.**
- **Misrepresentation of the sources that were used.**

The instructor has the right to fail the coursework or deduct marks where plagiarism is detected

- ***Student Complaints Policy***

Students at The Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

- ***Absences from exams***

If a student misses an examination, then he/she has the opportunity to do a make-up examination, according to the University Regulations. A student is not allowed to have a makeup exam unless he/she presents a valid excuse within 72 hours of the scheduled exam or when the excuse is lifted. The excuses are presented to the Excuse Committee, which has the right to accept or refuse the excuse. Only a student with an accepted excuse will be able to take the make-up exam. (The time and date of the makeup exams will be announced at the appropriate times).

- ***Health and safety procedures***

College members and students must at all times conform to Health and Safety rules and procedures.

COURSE ASSESSMENT

Course Calendar and Assessment

Students will be graded through the following means of assessment and their final grade will be calculated from the forms of assessment as listed below with their grade weighting taken into account.

Assessment	Grade Weighting	Approximate Time
Mid Exam	40%	Sun 4-05-2025
Practical Exam	20%	Sun 11-05-2025
Final Exam	40%	Sun 11-06-2025

Description of Exams
Test questions will predominately come from the material presented in the lectures. The exam will consist of multiple-choice questions for the regular exams and short essay questions for makeup exams (for students with accepted excuses, only documented absences will be considered as per the Hashemite University guidelines).

Grades are not negotiable and are awarded according to the following criteria:

Letter Grade	Description	Grade Points
A+	Excellent	4.00
A		3.75
A-		3.50
B+	Very Good	3.25
B		3.00
B-		2.75
C+	Good	2.50
C		2.25
C-		2.00
D+	Pass	1.75
D	Pass	1.50
F	Fail	0.00
I	Incomplete	-