



Deanship of Academic Development
and International Outreach

عمادة التطوير الأكاديمي
والتواصل الدولي

Syllabus*: Neurosciences II (111501306) Third Year-Second Semester-2023/2024

COURSE INFORMATION	
Course Name: Neurosciences II Semester: 2nd Department: Anatomy, physiology & biochemistry Faculty: Medicine	Course Code: 11150130 Section: Preclinical Modules Core Curriculum: MD program
Day(s) and Time(s): Variable Classroom: Faculty of Medicine Theatre Theoretical lectures: Faculty of Medicine Theatre Practical sessions: labs of Physiology	Credit Hours: 4 Prerequisites: NA
COURSE DESCRIPTION	
<p>This is an integrated system-based module which explores anatomy, physiology, pharmacology, microbiology, pathology and Community Medicine of the nervous system. The course provides integrated knowledge covering the peripheral nervous system including peripheral nerves, nerve plexuses and peripheral nerve branches cranial nerves and special senses. The course also highlights structures in the head and neck relevant to cranial nerves.</p> <p>Based on an understanding of normal structure, function relationship, neural connections of peripheral nervous system and special senses students will learn pathophysiological basis of various neurological disorders of nervous system. In addition, the course introduces common tumors and degenerative diseases of the nervous system, their pathology and histopathology. Common diseases affecting the nervous system and their epidemiology are also covered. Pharmacology of autonomic nervous system and pharmacology management of peripheral nervous disorders are also discussed.</p>	

The overall goal of this course is to provide medical students with foundations for understanding the impairments of sensory and motor functions, diseases, and pharmacological management of these disorders and the application of knowledge and foundation in in clinical practice. The objectives of this course are achieved via selected lectures and relevant laboratory sessions.

DELIVERY METHODS

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

- PowerPoint lectures and active classroom-based discussion
- Relevant papers and reading materials
- E-learning resources: e-reading assignments, virtual meetings, and practice quizzes through Microsoft Teams.

FACULTY INFORMATION

Course Coordinator	
Name	Dr. Amany Mohamed Allam Swilam
Academic Title:	Assistant Professor- Anatomy& Embryology
Office Location:	Ground floor (1031), Faculty of Medicine – Hashemite University
Telephone	0779513469
Email Address:	amany@hu.edu.jo
Office Hours:	Office hours: Sunday (11-1 pm), Tuesday (11-1 pm).

Faculty members:

Subject	Members	Email Address	Office location	Office hours
Anatomy	Dr Ashraf Sadek	ashrafm@hu.edu.jo	3031	Sunday 11-1 Tuesday 11-1
	Dr. Heba Ali	Heba_ali@hu.edu.jo	1092	Sunday 12-2 Monday 12-2
Physiology	Dr. Shimaa Nasr	shaimaa@hu.edu.jo	3020	Sunday 11-1 Wednesday 11-1
Pathology	Dr. Ola Karasneh	Olaa@hu.edu.jo	1017	Sunday 10-12 Tuesday 10-12
Pharmacology	Dr. Yassmin Sleim	yasmeenm@hu.edu.jo	1022	Sunday 10.5-12.5 Tuesday 10.5-12.5
Microbiology	Dr. Hala tabl	halaa_mo@hu.edu.jo	1041	Sunday 11-1 Tuesday 11-12
Biochemistry	Dr. Ahmed Salem	asalem@hu.edu.jo	1019	Monday & Wednesday 9 - 1
Community Medicine	Dr. Omnia Anwer	omnia@hu.edu.jo	1021	Monday & Wednesday 11-12, 1-2
Clinical	Dr. Abd El Halem	newhaleem@gmail.com		

lectures				
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REFERENCES AND LEARNING RESOURCES

ANATOMY:

- Clinical Neuroanatomy. By R. S. Snell.
- Clinical Anatomy for Medical Students. By R. S. Snell.
- Principles of Human Anatomy. By G. J. Tortora.
- Basic Histology. By C. Junqueira.
- Before We Are Born. By K.L. Moore and T.V.N. Persaud.
- www.medicalstudent.com or search the www for any subject of your preference.

PHYSIOLOGY:

- Textbook of Medical Physiology, by Guyton and Hall.

BIOCHEMISTRY:

- Harper's Biochemistry. By Robert K. Murray and Co.,
- Supplementary Departmental Handouts.

PATHOLOGY:

- Basic Pathology. By Kumar, Cotran and Robbins.
- Essential Pathology. By Rubin.
- Supplementary handouts

MICROBIOLOGY:

- Medical Microbiology. By John C Sherris.

PHARMACOLOGY:

- Lipincott's Illustrated Reviews: Pharmacology 7th edition
- Goodman and Gilman's: The pharmacological basis of therapeutics. 13th edition
- Basic and clinical pharmacology, Bertram and Katzung. 12th edition
- Clinical Pharmacology. D.R. Laurence, P.N. Bennet, and M.J. Brown. 11th edition

COMMUNITY MEDICINE:

- Community Medicine with Recent Advances Third Edition, AH Suryakantha, JAYPEE BROTHERS MEDICAL PUBLISHERS (P) LTD
- Parks Textbook Of Preventive & Social Medicine 23rd Edition
- Monica's Text Book Community Medicine Part 1
- Monica's Text Book Community Medicine Part 2

CLINICAL LECTURES

- Overview of Peripheral Nervous System Disorders <https://www.msmanuals.com/professional/neurologic-disorders/peripheral-nervous-system-and-motor-unit-disorders/overview-of-peripheral-nervous-system-disorders>

TOPICS DETAILS/ STUDENT LEARNING OUTCOMES MATRIX *

Course Objectives	Course Student Learning Outcomes			Assessment Method
Learning objectives outcomes	<u>TOPIC (SUBJECTS & NUMBER OF LECTURES / SUBJECT)</u>	<u>SUBJECT</u>	<u>Intended Learning Outcomes</u>	-Online quizzes. -Exams
<p><u>A-Biomedical:</u></p> <ol style="list-style-type: none"> Describe the functions of the central and peripheral nerves and relate structure to function. Describe and identify the gross morphology and microanatomy of the of the peripheral nerves of peripheral nervous system. Outline the of the origin and destination of peripheral nerves and cranial and describe their sensory and motor functions. Identify the organs of the special senses and describe their anatomical features, 	<p>*T1 <u>Central nervous system :</u> <u>The total number of lectures for the topic:18 lectures):</u></p> <p>Anatomy 7 Pathology 6 Microbiolog 4 Community medicine 1</p>	<p><u>Anatomy:</u> Face, scalp & trigeminal nerve. The external, middle ear & cranial nerve VII Inner ear & cranial nerve VIII. The neck. Triangles of the neck & cranial nerves XII. Development of head & neck. Cranial nerves IX & X Tongue, submandibular region & cranial nerve XI.</p> <p><u>*Pathology:</u> CNS tumors Primary Diseases of Myelin CNS infections & Prion Diseases</p>	<ol style="list-style-type: none"> Identify the gross anatomy and structural component of the skull and neck, especially structures related to cranial nerves. Identify the name number of cranial nerves and describe their sensory or motor functions of these nerves. Describe the origin, branches, route and final destinations and structures innervated by cranial nerves, and autonomic and somatic component of cranial nerves. Define the major clinical manifestations of each cranial nerve injury and understand the neurological sequel of lesions in cranial nerves. <p>Describe common disorders of special sensations caused by damage in sensory organs or lesions in neuronal pathways and neurological sequelae of these lesions.</p> <p>Describe the general features of primary CNS tumors in comparison to other tumors in the body, classify and know the gross, the histopathological features and the prognosis of the various types of primary CNS tumors.</p> <p>Describe the common malignant Metastatic Secondaries in the CNS, their pathologic characteristics & define the Paraneoplastic Syndromes. Know the general features of demyelinating diseases, with special</p>	

<p>histology and function.</p> <p>5. Review the neurotransmitters and drugs modifying the functions of the autonomic nervous system.</p> <p>6. List most important drugs used in the treatment of disorders that affect the peripheral nervous systems including their pharmacologic properties, indications, doses and side effects.</p> <p>7. List the pathologic disorders that affect the central and peripheral nervous systems, their pathogenesis, manifestations, and histological features.</p> <p>8. List the common diseases of the nervous system, including their etiologic agents, pathogenesis, manifestations, describe the</p>			<p>emphasis on Multiple Sclerosis, its clinical & morphological characteristics</p> <p>Describe the Pathologic Features, Causes, Routes of infection, and Effects of Prion Diseases, including Sporadic, Familial, Iatrogenic & Variant Forms (vCJD) of Creutzfeldt-Jakob disease.</p>	
		<p><u>Microbiology</u></p> <p>Purulent bacterial meningitis</p> <p>Prion disease</p> <p>CNS infectious diseases</p> <p>Aseptic meningitis</p> <p>encephalitis</p>	<p>Describe the Pathologic Features, Causes, Routes of CNS infection, and Effects of Prion disease</p>	
		<p><u>Community medicine</u></p> <p>Epidemiology of the meningitis, stroke, Parkinson's disease</p>	<p>describe the epidemiology of stroke, Parkinson's disease, and meningitis</p>	
		<p><u>Anatomy</u></p> <p>Central pathways for special senses</p> <p>The orbit</p> <p>&The eye Optic nerve</p>	<p>Identify central Pathways for special senses (olfactory, taste, visual, auditory & vestibular pathways).</p> <p>Describe the gross anatomy, histology and functions of special sensory organs.</p>	
		<p><u>Physiology</u></p> <p>Physiology of the eye.</p> <p>Pupil Reflexes and accommodation</p> <p>Neurophysiology of retina</p> <p>Central neurophysiology of vision</p> <p>1</p> <p><u>Biochemistry</u></p> <p>of vision</p> <p>Physiology of Hearing</p> <p>Vestibulo-ocular reflexes (VOR) & Eye movements</p> <p>Balance & Equilibrium.</p>	<p>Identify The principle function of the special sensory organs</p> <p>Describe the structure and function of the neural elements of organs (special sensory receptors).</p> <p>Explain how various environmental stimuli are converted to sensory signals (ionic basis of sensory transduction and mechanism of sensory coding).</p> <p>Outline and identify the components of the central neuronal pathways carrying special sensations to the cerebral cortex and their function.</p>	

<p>epidemiology of diseases that affect the nervous system and management if possible.</p>		<p>Chemical senses, taste & smell</p>	<p>Outline important biochemical basis of vision and describe the role of vitamin A in vision</p>	
<p>9. List most important drugs used in the treatment of disorders that affect the peripheral nervous systems including their pharmacologic properties, indications, doses and side effects.</p> <p>10. Correlate the basic biomedical knowledge to the clinical skills</p>	<p>T3: <u>Peripheral nervous system</u> <u>The total number of lectures for the topic : 13 lectures</u></p> <p>Anatomy 2 Pharmacology 6 Pathology 2 Microbiology 1 Community medicine 1 Biochemistry 1</p>	<p><u>Anatomy</u> Histology of peripheral nervous system . Cervical plexus Brachial plexus Lumbosacral plexus. Sympathetic and parasympathetic nervous system</p>	<p>Identify spinal nerves at different levels of spinal cord and their functions. Describe the structure of nerve plexuses and identify the distribution of nerves of the cervical plexus, brachial, lumbar and sacral plexuses. Identify the origin, branches, route and final destinations and structures innervated by autonomic component of peripheral nerve and cranial nerves.</p> <p>6. Define the major clinical manifestations of spinal nerves injury and understand the neurological sequel of lesions in these nerves.</p> <p>7. Use this information to build a diagnosis of different neurological disorders resulted from lesions involving PNS, and cranial nerves or spinal cord trauma.</p> <p>8. Describe the clinical significance of dermatomes.</p>	
<p><u>B-Critical thinking skills:</u></p> <p>1-Observe, identify and predict health problems based on previous experience and make decisions based on evidence rather than opinion</p> <p>2- Draw conclusions about the collected data (inference).</p> <p>3- Maintain good communication habits, such as active listening and respect.</p> <p>4- Improve problem-solving skills.</p> <p>5- Demonstrate knowledge of resources</p>		<p><u>Pharmacology</u> Directly acting cholinergic agonists Indirectly acting cholinergic agonists Cholinergic antagonists Adrenergic agonists. Adrenergic agonists. Adrenergic agonists. Adrenergic antagonists. Adrenergic antagonists.</p>	<p>Describe drugs affecting modifying autonomic nervous system transmission, their classification, their effects mechanism of action and use in management of peripheral nervous diseases. Identify drugs used in the management of common neurological disorders of the nervous system and describe their mechanism of action, side effects and rational of using these drugs.</p>	

and tools available to support lifelong learning	<p><u>Pathology and biochemistry</u> Peripheral nerves Diseases</p>	<p>Describe common disorders of special sensations caused by damage in sensory organs or lesions in neuronal pathways and neurological sequelae of these lesions.</p> <p>Describe the Origin, types, sites, gross & microscopic features and effects of each one of the peripheral nerve tumors.</p> <p>Define the Causes & Pathologic features of the three Familial Tumor Syndromes: Type 1 & 2 Neurofibromatosis, Von Hippel-Lindau Disease, and Tuberous Sclerosis.</p> <p>Know the various causes and types of peripheral neuropathies.</p> <p>Describe the biochemical principles of peripheral neuropathies including diabetic neuropathy and vitamins involved (especially thiamine and pyridoxine)</p> <p>Describe the causes, routes of infection, pathologic features, CSF Findings, effects, & complications of (1) Acute pyogenic meningitis (2) Aseptic meningitis (3) Chronic Tuberculous meningitis, (4) Neurosyphilis.</p> <p>Describe the most Characteristic Histologic Features of Viral Encephalitis.</p> <p>comment on the Pathologic Features of nervous System Infection by:</p> <p>Arboviruses; Herpes Simplex Virus Type 1& 2, Varicella-Zoster Virus, & Cytomegalovirus, Poliovirus, Rabies, & Progressive Multifocal Leukoencephalopathy and fungi</p>
	<p><u>Microbiology</u> Infectious diseases of the peripheral nervous system:</p>	<p>Describe the Pathologic Features, Causes, Routes of peripheral nervous system infections</p>
	<p><u>Community medicine</u> Epidemiology of infections of the peripheral nervous system& Epidemiology of common</p>	<p>describe the epidemiology of common infectious diseases affecting the peripheral nervous system.</p>

		peripheral nervous system disorders		
	Clinical sessions (2) -peripheral neuropathy -peripheral nerve injury: types and management -infections of the PNS -tumors of PNS -clinical approach: history and physical examination of PNS - diagnostic tools: NCS			
	Practical Sessions			
	<u>Anatomy labs (2)</u>	Brachial plexus and Nerves of the upper limb. Lumbo-sacral plexus and nerves of the lower limb.	ILOS To identify and recognize individual structures. Compare & contrast between student's understanding and the real thing seen in the lab.	
	Physiology lab (1)	Visual acuity test, Snellen Charts. Color vision test using Ishihara charts. Confrontational Perimetry Auditory tests, including Rennin's and Webber's tests Audiometry caloric test	to perform Visual acuity test Color vision test, experiments demonstrating and interpret the results to perform: Auditory tests, including Rennin's, Webber's, and caloric test tests and interpret the results	
	Microbiology lab (1)	CSF test	identify CNS pathogens using CSF analysis. identify the method of specimen collection: indications and contraindications, equipment, process of lumbar puncture, transportation of specimen, storage and complications of LP. identify media used for cultures ,	

			Identify the pathogenic organisms	
	Pathology labs (2)	pathological lesions of the various CNS disorders	identify, describe and diagnose the common and the important pathological lesions of the various CNS disorders	

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 needs.

Special Needs Section: Student Services and Care Unit

Tel: 053903333 ext. 4132 / 4583 / 5023

Location: Deanship of Students Affairs

Email: stydent@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 a 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 offense and can result in your work losing marks or being failed. HU 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.

Late or Missed exams:

In all cases of assessment, students who fail to attend an exam, on the scheduled date without prior permission, and/or are unable to provide an accepted medical note, will automatically receive a fail grade for this part of the assessment.

- Submitting a term assignment or class project on time is a key part of the assessment process. Students who fail to submit their work by the deadline specified will automatically receive a 10% penalty. Assignments handed in more than 24 hours late will receive a further 10% penalty. Each subsequent 24 hours will result in a further 10% penalty.
- In cases where a student misses an assessment on account of a medical reason or with prior permission, in line with University regulations, an incomplete grade for the specific assessment will be awarded, and an alternative assessment or extension can be arranged.

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.

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.

For the modules OR general courses WITH PRACTICAL SESSIONS, please use the following table:

Assessment	Grade Weighting	Deadline Assessment
Exam 1	40%	TBD
Exam 2 (practical)	20%	TBD
Final Exam	40%	TBD

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 HU guidelines).

Grades are not negotiable and are awarded to the *MD program* 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	-

WEEKLY LECTURE SCHEDULE AND CONTENT DISTRIBUTION

Will be announced 1 week before starting the course /module.