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Course Specification

Central Nervous System CNS-351

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	**Central Nervous System**			
Course Code (according to the bylaw)	**CNS- 351**			
Department/s participating in delivery of the course	**1. Anatomy & Embryology** **2. Histology** **3. Physiology** **4. Biochemistry** **5. Pathology** **6. Pharmacology** **7. Microbiology** **8. Parasitology** **9. Medicine**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (class activities)**	**Total**
	2.4	**1.8**	**1.8**	**6**
Course Type	اجباري			
Academic level at which the course is taught	الفرقة/المستوي الثالث			
Academic Program	**بكالوريوس الطب والجراحة (2+5) نظام الساعات المعتمدة** Bachelor of Medicine & Surgery **(**Integrated program 5+2 **)**			
Faculty/Institute	**Faculty of Medicine**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Fatma Mohamed Gaballah**			

Course Specification Approval Date	**9/16/2025**
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Education and Student Affairs Committee No.(296) 14/9/2025** **Faculty council No. (500)**

2. Course Overview (Brief summary of scientific content)

The course aims to provide medical students with a comprehensive understanding of the structure, function, and disorders of the central nervous system. It enables students to integrate basic neuroanatomy, neurophysiology, and neurochemistry with clinical applications, thereby preparing them to recognize, diagnose, and manage neurological conditions.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
4.5	Outline the pharmacokinetics, pharmacodynamics, indications, interactions, contraindications, and side effects of various therapeutic modalities (pharmacological and non-pharmacological) for acute, chronic and life-threatening illnesses.	4.5.1	Describe the pharmacodynamics of antidepressant& antiepileptic drugs and the differences between them and Describe their clinical uses, adverse effects and drug interactions of them
		4.5.2	Describe the major drugs used in treatment of different types of seizures
		4.5.3	Identify the injures of cranial & spinal nerves and applied anatomy of CNS.
		4.5.4	Recognize the etiology and pathogenesis, pathological features(gross and microscopic) of CNS tumors
4.7	Integrate the facts of the basic sciences with clinical data.	4.7.1	provide the undergraduate students with basic scientific knowledge about normal anatomical and histological structure and function of the nervous system including: neurons, neuroglial cells, cerebral cortex and cerebellar cortex. And spinal cord.
		4.7.2	Recognize the etiology including the role of (genetics, immunological, microbiologic, metabolic, traumatic and toxic causes), pathogenesis and pathological features of

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
			CNS demyelinating ,vascular and obstructive diseases
		4.7.3	Recognize the etiology and pathogenesis ,pathological features(gross and microscopic) of CNS tumors
		4.7.4	Describe different metabolic aspects of the brain.
		4.7.5	Describe neurotransmitters of the brain and classify them according to their chemical nature and action.
		4.7.6	Explain on biochemical basis of neurological diseases & neurotransmitter abnormalities.
		4.7.7	Provide the undergraduate students with basic scientific knowledge that enables them to understand parasitic infections of the CNS, how to diagnose, and how to treat patients with parasitic infections.
		4.7.8	Provide essential practical knowledge that enables them to illustrate the morphology & life cycle of parasites affecting the CNS
		4.7.9	Provide the undergraduate students with basic knowledge concerning infectious causes of meningitis; general characters, pathogenesis, laboratory diagnosis and preventive measures.

4. Teaching and Learning Methods

1- Modified Lectures
2. Practical sessions
3. Tutorials
4. Case Based Learning
5. **Directed Self Learning: sessions**
6. **Online Lectures on Benha E- learning platform & survey.--learning platform (thinqi)https://belc.bu.edu.eg/%D9%85%D9%86%D8%B5%D8%A9-%D8%AB%D9%8A%D9%86%D9%83%D9%89/**

Course Schedule (6 credits/ 6 weeks)

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/tutorials/CBL)	Training (Practical/ Clinical/ .....)	Self-learning DSL	Other Skill lab
1	Anatomical parts of the nervous system and Anatomy of the spinal cord &spinal meninges Bl. Supply of spinal cord	20	1	2		
	Anatomy of Brain stem		1	2		
	Functional organization of the CNS		1			
	Sensory receptors & Sensory transduction		1			
	Development and anomalies of the CNS		2			
	Histological structure of neuron, neuroglial cells, peripheral nerves		1			
	Histological structure of cerebral cortex, cerebellum and the spinal cord		1			
	Synapse and mechanism of synaptic transmission		1			
	somatic sensation & physiology of pain		1			
	Temperature, touch, and deep sensations, and the Somatosensory cortex		1			
	Anatomy of cerebellum and 4th ventricle		1	2		
	Metabolism of brain		1			
	Neurotransmitters		1			
2	CSF composition	19		2		
	Examination of sensory system			2		

	LM of nerve trunk, cerebral cortex, cerebellum			**2**		
	Teratology: Ascending and descending tracts		**2**			
	Anatomy of diencephalon		**1**			
	Morphology of the cerebral hemisphere		**1**	**2**		
	3rd ventricle		**2**			
	Function of spinal and cord reflexes (stretch reflex and skeletal muscle tone)		**1**			
	Functional Areas of Cerebral Cortex		**1**			
	Anatomy of the white matter		**1**			
	Sedative-hypnotic drugs		**1**			
	Cortical control of motor functions and functions of motor descending tracts		**1**			
3	**Reticular formation, EEG and sleep**	**18**	**1**			
	cranial nerve nuclei and spinal nerve		**2**			
	CNS neoplasm		**1**			
	lateral ventricle		**1**			
	Examination of the motor system			**2**		
	LM of spinal cord (cervical, thoracic and lumbar), medulla (closed & Open), pons and midbrain.			**2**		
	Motor function of cerebellum, cerebellar dysfunction		**1**			
	Anatomy of basal ganglia		**2**			
	CNS inflammation			**2**		
	CNS neoplasm			**2**		
	Transverse sections of the brain & spinal cord			**2**		
4	**Anti- epileptic drugs**	**17**	1			**Formative assessment**
	Leprosy		**2**			

	Naegleria fowleri and Acanth amoeba spp. (free living amoebae		1	2		
	Bacterial meningitis		1			
	Analgesics 1		1			
	Analgesic 2		1			
	Involuntary movements and tremors		2			
	Anatomy of the cerebral meninges and CSF		2			
	CNS vascular diseases & trauma		1			
	Blood supply of the brain		1			
	Motor function of the basal ganglia		1			
	Functions of the hypothalamus and thalamus		1			
5	Bacteriological Examination of CSF	+16		2		
	Internal structure of cerebrum			2		
	De-myelinating, degenerative and obstructive diseases		2			
	Antidepressant drugs		1			
	Antiparkinsonian drugs		1			
	DSL Topics: . Local anesthetics . The Biochemical basis of neurotransmission & diseases				2	
	Cerebral oedema and raised intracranial tension		2			
	Cognitive function of the brain memory, learning and physiology of speech		1			
	Africantrypanosomes (African sleeping sickness)		2			
	Viral meningitis, encephalitis and rabies		1			
6	coronal sections of the brain & spinal cord	11		2		

	Poliomyelitis & Prion		**2**			
	Cysticercosis and Coenurosis(Taeniamulticeps		**1**	**2**		
	Mechanism of walking and abnormal gaits		**2**			
	Disorders of basal ganglia		2			

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of Total Course Marks
1	Formative exam	beginning of 4th week	-	-
2	Mid-module assessment	4th week	36	24%
3	Final Written Exam	End of first term	60	40%
4	Final Practical Exam	beginning of 6th week	45	30%
5	Assignments /Portfolio/ DSL/CBL	Throughout the module	9	6 %
			150	100%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course**	• Clinical Anatomy by Regions; 10th ed.; Snell R.S., Lippincott Williams & Wilkins, 2018. • Gray's Anatomy for Students, 2nd ed. Churchill Livingstone/Elsevier, Philadelphia,2010 • Gray's anatomy : the anatomical basis of clinical practice (Forty-two edition.). Standring, S. (Ed.). Elsevier Limited.(2020). • Langman's Medical Embryology; 15th ed.; Sadler T.W. and Langman J., Wolters Kluwer, 2023. • Cell Biology and Histology; 9th ed.; Gartner L.P. & Hiatt J.L., Wolters Kluwer, Philadelphia, New York, London, 2024.

		• Junqueira' s Basic Histology; Text & Atlas; 17th ed.; Mescher A.L. McGraw-Hill Education, New York, London, Toronto, 2024. • Ganong's Review of Medical Physiology; 26th ed.; Barrett K.E., Barman S.M., Yuan J.X-J and Brooks H., McGraw-Hill Companies, 2019. • Oxford Handbook of Medical Sciences ,third edition 2021, Robert Wilkins, Simon Cross, Ian Megson, David Meredith, OXFORD university press. • Textbook of Medical Physiology; 14th ed.; Guyton A.C. and Hall J.E., Saunders/Elsevier Co., 2021. • Medical Biochemistry: 6th ed.; Baynes J.W. and Dominiczak M.H., Elsevier Inc., 2022. • Harper's Illustrated Biochemistry; 32st ed.; Rodwell V.W. et al., McGraw-Hill Medical Co., 2022. • Clinical Chemistry; 9th ed.; Marshall W.J., Day A.P. and Lapsley M, Elsevier Co., 2020.. • Robbins Basic Pathology; 11th ed.; Kumar V.; Abbas A.K. and AsterJ.C., W.B. Elsevier Inc., 2023. • Basic and Clinical Pharmacology; 16th ed.; Katzung B.G., McGraw Hill Medical Co., 2023. • Whalen, K. (2022). Lippincott's Illustrated Reviews: Pharmacology (8th ed.). Lippincott Williams & Wilkins • ABC of Learning and Teaching in Medicine; 3rd ed.; Cantillon P., Wood D. and Yardley S., Newark John Wiley & Sons Pub. Co., 2017. • Markell and Voge's Medical Parasitology-E-Book; 10th ed.,; John D.T., Markell E.K., Petri W.A. and Voge M., Elsevier Health Sciences; 2020.
	Other References	• Lippincott's Illustrated Reviews: Microbiology; 4th ed.; Cornelissen C.N., Fisher B.D. and Harvey R.A., Lippincott Williams & Wilkins, 2020. • Adams and Victor's Principles of Neurology; 11th ed.; Ropper A.H., Samuaels M.A. and Klein J., McGraw Hill Professional, 2019.

	Electronic Sources	**Periodicals, Web sites:** 1. http://www.WHO.int.com. 2. http://www.CDC.org. 3. http://evolve.elsevier.com/Hall/physiology/3
	Learning Platforms	**learning platform (thinqi)** **https://belc.bu.edu.eg/%D9%85%D9%86%D8%B5%D8%A9-%D8%AB%D9%8A%D9%86%D9%83%D9%89**
	Other	---
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	• Lecture halls provided with audio- visual aids (data show – smart boards – sound system) •
	Supplies	1. Lecture Room with enough number of comfortable seats & supplied with; - Audiovisual equipment needed for power point presentation data show – smart boards – sound system- desktop 2. Whiteboard 3. Classrooms for small group teaching (instrument for physical examination like beds, blood pressure measuring devices, stethoscope) 4. Well-equipped laboratories 5. Digital slides 6. Gross wet specimens for demonstration
	Electronic Programs	--
	Other	· **Library: available reference textbooks and internet access** **Egyptian knowledge bank**

Name and Signature **Course Coordinator** **Dr. Fatma Gaballah**	**Name and Signature** **Program Coordinator** **Prof.Dr/ Eman Araby**