بسمه

In the Name of God

Hamadan University of Medical Sciences and Health Services
Educational Deputy of the University
Center for Studies and Development of Medical Sciences Education

Theory/Practical Lesson Plan Form

Dear Colleagues,

As the teaching-learning process is one that requires careful planning to achieve its objectives, the preparation of a lesson plan at the beginning of the educational process (as a map and guide for instructors and students) is essential. It serves as one of the main tools for the educational activities of instructors. Therefore, we kindly ask all instructors to pay utmost attention to completing the lesson plan.

Course Title: Anatomy of the Nervous System

Instructors: Dr. Iraj Amiri, Dr. Elham Shiri

Course Coordinator: Dr. Elham Shiri

Head of Department: Dr. Maryam Bahmanzadeh

Credits: 1.5 Theory, 0.4 Practical

Student Major & Level: Doctor of Medicine (Professional Doctorate)

Academic Semester: First Semester, Academic Year 2024–2025

Teaching Location: Faculty of Medicine

Theoretical Unit – Anatomy of the Nervous System

Session	Topic	Learning Objectives	Domain	Teaching Methods	Duration	Teaching Aids	Evaluation Methods
1	Embryology of the Nervous System	1. Explain induction of the neural plate. 2. Name brain vesicle divisions. 3. Describe formation of the spinal cord. 4. Explain formation of spinal nerves. 5. Describe formation of brainstem. 6. Describe overall development of cerebellum and brain. 7. Explain causes of congenital anomalies such as anencephaly and spina bifida.	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A
2	Histology of the Nervous System	1. Describe soma, dendrite, and axon structure in neurons. 2. Explain characteristics and functions of glial cells (astrocyte, microglia, oligodendrocyte, ependymal). 3. Identify white	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A

		and gray matter of spinal cord and cell types. 4. Describe histology of cerebellum. 5. Describe cortical layers. 6. Recognize peripheral nervous system glial cells. 7. Explain peripheral nerve organization and myelination. 8. Describe ganglia types. 9. Explain nerve regeneration in PNS.					
3	Spinal Cord Anatomy I	1. Recognize external features of the spinal cord. 2. Explain formation of cauda equina and lumbar cistern. 3. Describe formation of spinal nerves and nerve plexuses. 4. Relate vertebral levels to spinal segments. 5. Describe sympathetic distribution. 6. Identify spinal and epidural anesthesia types.	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A
4	Internal Structure and Tracts of Spinal Cord	1. Describe laminae and nuclei in anterior/posterior horns and their functions. 2. List ascending/descending tracts and	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A

		their roles. 3. Differentiate spastic vs. flaccid paralysis. 4. Explain spinal reflex mechanisms. 5. Describe vascular supply of spinal cord.					
5	Cranial Nerves and Medulla Oblongata	1. Explain cranial nerve function, innervation, and clinical implications. 2. Describe external features of medulla. 3. Explain associated nuclei in medulla sections. 4. Describe medullary lesions and signs.	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A
6	Pons and Midbrain Anatomy	1. Describe external features of the pons. 2. Explain pons nuclei in cross-sections. 3. Describe external features of midbrain. 4. Explain midbrain nuclei in cross-sections. 5. Describe lesions and clinical signs of pons/midbrain.	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A
7	Cerebellum Anatomy	1. Describe anatomical divisions and parts of cerebellum. 2. Explain cerebellar cortex and nuclei. 3. Differentiate new, old, and	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A

		archicerebellum, including inputs/outputs. 4. Explain cerebellar peduncles and their connections. 5. Describe clinical signs of cerebellar damage.					
8	Diencephalon Anatomy	1. List diencephalon parts. 2. Identify thalamic nuclei, functions, and connections. 3. Describe hypothalamic nuclei, functions, and connections. 4. Explain subthalamus structure and lesions. 5. Describe pineal gland and epithalamus. 6. Identify structures and walls of third ventricle.	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A
9	Cerebral Hemispheres – External Surface	1. Identify cerebral surfaces and borders. 2. Name gyri and sulci with functions. 3. Describe clinical signs of injury to each gyrus. 4. Describe Broca's, Wernicke's, and related areas with clinical relevance.	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A
10	Cerebral Hemispheres – Gray	1. Name cortical layers and their cells. 2. Classify	Cognitive	Lecture, group discussi	120 min	PowerPoint, whiteboa	Quiz, Q&A

	Matter – Ventricles	cortex by number of layers. 3. Name basal ganglia nuclei. 4. Explain basal ganglia functions and connections.		on		rd, projector, educational video	
11	Cerebral Hemispheres – White Matter – Ventricles	1. Describe white matter organization. 2. List commissural fibers. 3. Explain commissural fiber functions. 4. Locate lateral ventricles and parts. 5. Identify lateral ventricle relations.	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A
12	Limbic System – Cerebral Vasculature – Meninges	1. Name limbic system components. 2. Describe limbic functions. 3. Explain hippocampus structure and function. 4. Describe other limbic structures. 5. Explain vascular supply of the brain and clinical outcomes of vascular lesions. 6. Describe venous drainage of the brain. 7. Explain meningeal organization. 8. Describe dural venous sinuses.	Cognitive	Lecture, group discussion	120 min	PowerPoint, whiteboard, projector, educational video	Quiz, Q&A

Practical Unit – Anatomy of the Nervous System

Session	Topic	Learning Objectives	Domain	Teaching Methods	Duration	Teaching Aids	Evaluation

							Methods
1	Nervous System Histology	Identify gray/white matter on sections. Identify neuron soma, Nissl bodies, and nuclei. Identify glial cell types. Identify meninges on spinal cord. Identify cerebellar cortical layers. Identify neurons and glia in ganglia. Identify epineurium, perineurium, endoneurium in nerve sections.	Cognitive (application)	Observation, demonstration, group discussion	180 min	Light microscope, histology slides	Class Q&A, quiz, checklist
2	Spinal Cord Anatomy	Show filum terminale and cauda equina on models. Identify spinal cord grooves and name them. Identify ventral/dorsal roots and dorsal root ganglion. Show spinal nerve and anterior/posterior rami. Identify sympathetic chain and white/gray	Cognitive (application)	Observation, demonstration, group discussion	180 min	Models, dissection table	Quiz, checklist

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3	Brainstem Anatomy	Show pyramids, olives, gracile and cuneate nuclei on medulla models. Identify structures in floor of fourth ventricle. Identify cranial nerve exits (III–XII) on models. Identify external features of pons and midbrain on models.	Cognitive (application)	Observation, demonstration, group discussion	150 min	Models, dissection table	Quiz, checklist
4	Cerebellum and Diencephalon Anatomy	Show cerebellar hemispheres and vermis. Identify cerebellar sulci and lobes. Identify cerebellar blood supply on models. Identify diencephalon parts (thalamus, hypothalamus, metathalamus, subthalamus, epithalamus). Show third ventricle walls.	Cognitive (application)	Observation, demonstration, group discussion	150 min	Models, cadaver, dissection table	Quiz, checklist

5	Cerebral Hemisphere Anatomy	Show cerebral surfaces and borders on models. Identify all sulci and gyri. Identify commissures (corpus callosum, anterior, posterior). Show hippocampal structures. Identify brain vasculature on models.	Cognitive (application)	Observation, demonstration, group discussion	180 min	Models, cadaver, dissection table	Quiz, checklist

Grading Scheme

Assessment Type	Date	Tool	Weight
Quiz	Various	Multiple-choice and short-answer	5%
Midterm Exam	Various	Multiple-choice, descriptive, short-answer	35%
Final Practical Exam	Per academic calendar	Identification on models	20%
Final Theoretical Exam	Per academic calendar	Multiple-choice, descriptive, short-answer	35%
Other Activities	Ongoing	Class participation, answering questions, interest	5%
Total	–	–	**100%**

Refrence

1.Snell RS. Clinical anatomy for medical students. Lippincott Williams & Wilkins; 2021-2022.

2.Gray's anatomy for students E-book. Elsevier Health Sciences; February 22, 2019

3. Junqueira's Basic Histology: Text and Atlas, 17th Edition

4. Langman's Medical Embryology, 12th Edition

5.Gray's anatomy e-book: the anatomical basis of clinical practice Standring S, editor.. Elsevier Health Sciences; 2021 May 22.

6.Atlas of Human Anatomy/Frank H. Netter.Netter FH East Hannover, New Jersey. 2019;592.

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