

NEUROSCIENCE SYSTEM

Block NEU 312

2024 - 2025



Welcome Letter to the Students

My Dear Students:

On behalf of the Neuroscience System Block director, I want to welcome each student to Neuroscience System Block. You are about to begin one of the most important blocks and our aim is to integrate the knowledge and skills with the clinical aspects. We will do our best to correlate the relevant information for your clinical studies and how to apply knowledge to diagnose different diseases.

The study guide will present the details of necessary knowledge and intellectual skills related to each lecture that will cover its major aspects. The practical and case discussion will help you to practice and know more details which are unclear to you. The included reference books will help you find more information that you may need.

The staff members teaching the Neuroscience System Block are glad to help you. The members of all departments are dedicated to the Mission of the Faculty of Medicine.

We look forward to supporting your academic and personal success at the Faculty of Medicine

Sincerely,

Directors of Neuroscience System Block

Basic Information about the Block

Program on which the course is given Bachelor of Medicine and surgery (M.B.,B.Ch.).

Elements (Major or minor) of the program: (undergraduate).

Departments offering the course: Integrated between Anatomy, Physiology, Histology, Biochemistry, Microbiology, Parasitology, Pathology and Pharmacology Departments.

Academic year/level: third year/ semester 5

Date of specification approval: 2024/2025

⊗ **Title:** Neuroscience

⊗ **Code:** NEU-312

⊗ **Credit points:** 12.5

⊗ **Weeks:** 8 weeks

⊗ **Lectures:** 70 hours

⊗ **Practical:** 56 hours

⊗ **Student learning activities:** 188 hours

⊗ Case-based group discussion (35 hours), and formative assessment (26 hours).

⊗ **Total:** 375 hours

Block Credit Points

Block	Points	Weeks	Learning activities		
			Contact hours/points	Formative assessment/ Feedback	Assignments
Neuroscience	12.5	8 weeks	161 hours/ 5.3 points	0.86 point	6.34 points

NARS Competencies Covered by the Block

NARS areas covered by the block

The competency areas of the NARS- Medicine competency framework are

- 1- The graduate as a health care provider.
- 2- The graduate as a health promoter.
- 3- The graduate as a professional.
- 4- The graduate as a scholar and scientist.
- 5- The graduate as a member of the health team and a part of the health care system.
- 6- The graduate as a lifelong learner and researcher.

Sub competencies

Competency Area I: The graduate as a health care provider

- 1.1 Take and record a structured. patient centered history
- 1.2 Adopt an empathic and holistic approach to the patients and their problems.
- 1.3 Assess the mental state of the patient.
- 1.4 Perform appropriately-timed full physical examination of patients, appropriate to the age, gender, and clinical presentation of the patient while being culturally sensitive.
- 1.5 Prioritize issues to be addressed in a patient encounter.
- 1.6 Select the appropriate investigations and interpret their results taking into consideration cost/ effectiveness factors.
- 1.7 Recognize and respond to the complexity, uncertainty, and ambiguity inherent in medical practice.
- 1.8 Apply knowledge of the clinical and biomedical sciences relevant to the clinical problem at hand.
- 1.9 Retrieve, analyze, and evaluate relevant and current data from literature, using information technologies and library resources, in order to help solve a clinical problem based on evidence (EBM).
- 1.10 Integrate the results of history, physical examination and laboratory test findings into a meaningful diagnostic formulation.
- 1.11 Perform diagnostic and intervention procedures in a skillful and safe manner, adapting to unanticipated findings or changing clinical circumstances.
- 1.12 Adopt strategies and apply measures that promote patient safety.
- 1.13 Establish patient-centered management plans in partnership with the patient, his/her family and other health professionals as appropriate, using Evidence Based Medicine in management decisions.
- 1.14 Respect patients' rights and involve them and /or their families / carers in management decisions.
- 1.15 Provide the appropriate care in cases of emergency, including cardio-pulmonary resuscitation, immediate life support measures and basic first aid procedures.
- 1.16 Apply the appropriate pharmacological and non-pharmacological approaches to alleviate pain and provide palliative care for seriously ill people, aiming to relieve their suffering and improve their quality of life.

1.17 Recognize and respond to the complexity, uncertainty, and ambiguity inherent in medical practice.

Competency Area II: The graduate as a health promoter

2.1 Identify the basic determinants of health and principles of health improvement.

2.2 Recognize the economic, psychological, social, and cultural factors that interfere with wellbeing.

2.3 Discuss the role of nutrition and physical activity in health.

2.4 Identify the major health risks in his/her community, including demographic, occupational and environmental risks; endemic diseases, and prevalent chronic diseases.

2.5 Describe the principles of disease prevention, and empower communities, specific groups or individuals by raising their awareness and building their capacity.

2.6 Recognize the epidemiology of common diseases within his/her community, and apply the systematic approaches useful in reducing the incidence and prevalence of those diseases.

Competency Area III: The graduate as a professional

3.1 Exhibit appropriate professional behaviors and relationships in all aspects of practice, demonstrating honesty, integrity, commitment, compassion, and respect.

3.2 Adhere to the professional standards and laws governing the practice, and abide by the national code of ethics issued by the Egyptian Medical Syndicate.

3.3 Respect the different cultural beliefs and values in the community they serve.

3.4 Treat all patients equally, and avoid stigmatizing any category regardless of their social, cultural or ethnic backgrounds, or their disabilities.

3.5 Ensure confidentiality and privacy of patients' information.

Competency Area IV: The graduate as a scholar and scientist

4.1 Describe the normal structure of the body and its major organ systems and explain their functions.

4.2 Explain the molecular, biochemical, and cellular mechanisms that are important in maintaining the body's homeostasis.

4.3 Recognize and describe main developmental changes in humans and the effect of growth, development and aging on the individual and his family.

Block Specification**A. Basic Information:**

Program on which the course is given Bachelor of medicine and surgery (M.B., B.Ch.).

Elements (Major or Minor) of the program: Undergraduate.

Departments offering the course: all academic departments.

Academic year/level: 3rd year, 1st semester.

Date of specification approval: 2024 / 2025.

Title: Neuroscience.

Code: NEU-312.

Credit points: 12.5.

Lecture: 70 hours.

Practical: 56 hours.

Student learning activities: 35 hours (Cases) and 7 hours (formative assessment).

Total: 168 hours.

NEUROSCIENCE BLOCK MAP

Block	Departments involved	Code	Points	Days/ Weeks	Learning activities		
					Contact hours/ points	Formative assessment / Feed back	Assignments and other home and self-learning (portfolio-based evidence)
Neuroscience	All departments of basic sciences	NEU-312	12.5	8 weeks	5.3 points	0.86 point	6.34 points

Structure of the Block

Items	Lectures	Practical	Cases	Formative assessment	Total
Contact hours	70	56	35	26	187
Credit points	2.33	1.86	1.16	0.86	6.23

Participation of Different Departments in Neuroscience Module

Departments	Lectures		Practical		Cases	Total
Medical Physiology	24	34.2%	10	17.8 %	9.5	43.5
Anatomy	18	25.8%	24	42.8 %	10	52
Pharmacology	7	10%	6	10.8 %	3.5	16.5
Histology	6	8.6%	6	10.8 %	1	13
Pathology	5	7%	4	7.1%	5	12
Microbiology	4	5.8%	4	7.1%	2	10
Parasitology	4	5.8%	2	3.6%	2	8
Biochemistry	2	2.8%	-	-	2	4
Total	70	100%	54	100%	35	161

Blueprint of Block NEU-312

الدور الأول

Department	Mid exam marks 20%	Practical exam marks 30%	Final exam marks 40%	Portfolio marks 10%	Total (mid +final + practical) marks +18.5 portfolio marks
Anatomy	15	21	15		51
Histology	4	6	5		15
Biochemistry	1	-	3		4
Physiology	11	11	27		49
Pathology	3	4	5		12
Pharmacology	3	6	8		17
Microbiology	-	4	7		11
Parasitology	-	5	5		10
Total marks	37	57	75	18.5	187.5

Note :25% of the final Exam (short answer questions and modified short essay questions) 19 marks for the first round الدور الأول

And 28 marks for the second round للدور الثاني

الدور الثاني

Department	Final exam marks 60%	Practical exam marks 40%	Total (final + practical) marks)
Anatomy	29	32	
Histology	9.5	8	
Biochemistry	3	-	
Physiology	38	13	
Pathology	8	5	
Pharmacology	11	8	
Microbiology	7	5	
Parasitology	7	4	
Total marks	112.5	75	187.5

Professional Information

Block Aims

I. Overall Aims

This system-based course integrates the basic sciences into a study of neuroscience and behavior in both health and disease states. The overall goal of the Neuroscience course is to provide basic knowledge and understanding of the structure, function of the nervous system, biochemical basis of human behavior, as well as the pathological basis of neurological and mental disorders. Fundamental principles of anatomy, physiology, pharmacology, biochemistry, pathology, microbiology, parasitology and human behavior will be applied to pathological situations to distinguish the clinical basis for central nervous system disorders. This goal will be achieved via selected lectures, relevant laboratory sessions, cases, and self-directed learning methods. The goal of this module is to provide all future physicians, regardless of specialization, the skills to recognize neurological and psychiatric problems, and understand treatment strategies; and to facilitate the professional development of students to become doctor responsive to such needs.

II. Intended Learning Outcomes of the Block

At the end of this module, the students will be able to:

1. List muscles, blood supply and lymph nodes groups of the head and neck.
2. Clarify the structure of the scalp.
3. Recognize the cranial nerves and cervical plexus and the main signs of their injury.
4. Describe the boundaries and contents of the orbit.
5. Clarify the formation, course and distribution of cerebral blood vessels.
6. Know the formation, differentiation and development of the head and neck structures.
7. Describe the anatomy of meninges.
8. Discuss the ventricular system and cerebrospinal fluid (CSF) formation, composition and functions.
9. Describe the structure and functions of the ear and sound transmission and characteristics.
10. Describe the metabolism of the brain and nervous tissue.
11. Describe neurotransmitters and neuropeptides, characters, synthesis, function and destruction.
12. Describe the anatomy of the brain stem, spinal cord, cranial nerves and main ascending and descending tracts.
13. Draw the development of the spinal nerves.
14. Explain how information is processed in the nervous system through sensory receptors and transduction.
15. List the different types of receptors and their functions.
16. Mention different types of somatic sensations.
17. Summarize the mechanism of pain and its control.
18. Describe the pharmacodynamics and pharmacokinetic properties of opioid analgesics and list their clinical uses.
19. List and describe the pharmacology of general anaesthetic agents.
20. Summarize different parts of the cerebrum and location, characteristics, and functions of sensory and motor areas of the brain.
21. List different thalamic nuclei and their functions.
22. Describe components of reflex arc, functions of the afferents, interneurons and efferent neurons.
23. Describe the structure, types, and characteristics of the synapses.
24. Summarize stretch reflex: definition, receptors, types, properties, functions and supraspinal control.
25. List cerebellum structure, connections and functions.
26. Describe basal ganglia structure, connections and functions.
27. List structure, connections and functions of the vestibular apparatus. Explain the importance of the ear in the equilibrium process.
28. Summarize nuclei, connections and functions of hypothalamus.
29. Mention higher intellectual functions of the brain as sleep, speech, memory and learning and their mechanisms of action.
30. Define and describe the origin and development of different parts of the central nervous system.
31. List the different parts of the reticular formation and the limbic system and their

functions.

32. List the major Hypnotics/ Anxiolytics. Explain their pharmacodynamics, pharmacokinetic, therapeutic uses and side effects.
33. Summarize the most common causative organisms causing infectious diseases of the nervous system, organs of special sense and related pathological changes.
34. Mention the structure and functions of different parts of the eye.
35. List different refractory media of the eye and principles of optics.
36. Describe the mechanism of genesis of action potential on photoreceptors, components of the visual pathway, location and functions of visual cortex.
37. Explain the mechanisms of scotopic, photopic and colour vision.
38. Mention visual field, visual acuity and binocular vision.
39. Recognize the components of chemical sense and their functions.
40. Discuss the different nervous system neoplasms, their cell origin and classification.
41. Classify degenerative and demyelinating diseases of the CNS.
42. List the main bacterial, fungal, viral and parasitological pathogens that may affect the CNS and special sense.
43. Recognize types of intracranial haemorrhage, aneurysm, ischemia and infarction.

B. Intellectual Skills

1. Explore mechanism(s) of receptor adaptation and headache.
2. Differentiate primary and secondary hyperalgesia and fast and slow pain.
3. Interpret some clinical findings in relation to anatomical and developmental basis.
4. Explain the manifestations of head and cranial nerves injury on the basis of anatomical facts.
5. Differentiate between the functions of pyramidal and extrapyramidal tracts.
6. Explore different symptoms and signs of thalamic syndrome.
7. Explore the effect of lesion of different somatosensory and motor areas.
8. Describe factors that contribute to the high somatic sensory acuity of the hands and face.
9. Differentiate between electrical and chemical synapses.
10. Differentiate between synaptic potential and action potential.
11. Differentiate between reflex and motor tetanus.
12. Explore how synaptic plasticity is important for learning and memory.
13. Compare muscle tone and tendon jerk and stretch and inversed stretch reflexes.
14. Explain how Spinocerebellum and neocerebellum control voluntary movements and how neocerebellum is important in planning and programming voluntary movement.
15. Understand the mechanism of detection of angular and linear acceleration of the head by organs of equilibrium functions of auditory cortex and explain attenuation reflex, mechanisms of auditory sensory transduction, pitch perception, sound localization and differentiate inner and outer hair cells.
16. Understand the functions and the balance between different neurotransmitters in basal ganglia.
17. Differentiate between main clinical syndromes produced by damage in basal ganglia.
18. Explore hypothalamic connections with different endocrine glands, reproduction and metabolism.
19. Distinguish between different central nervous system malformations.
20. Know different types of sleep disorders.

21. Differentiate between various types of aphasia.
22. Explore cranial nerve nuclei and disorders of cranial nerves injury.
23. Correlate the knowledge gained from the multisystem discussed regarding normal and abnormal functions of the nervous system and special senses.
24. Explain the effect of injury and its clinical manifestations at various levels of the sensory and motor pathways on anatomical basis.
25. Compare normal and abnormal structure of nervous tissues.
26. Interpret the different results of clinical, laboratory and radiological examinations.
27. Explain the pathology of the CNS and understand the pharmacology of the drugs used in the treatment of these underlying diseases such as depression, epilepsy psychosis and parkinsonism.
28. Understand the pathogenesis of brain edema and explore the mode of transmission of the main bacterial, fungal, viral and parasitological infections of the CNS.
29. Explain mechanisms of accommodation, errors of refraction, chemical sensory transduction and mechanisms of adaptation.
30. Distinguish the roles of population and frequency coding in representing chemical sensory information.
31. Recognize causes of colour blindness, glaucoma and abnormal olfactory and gustatory sensation.
32. Explore mechanism of parkinsonism and demyelinating diseases.
33. Explore mechanism of aneurysm formation and causes of ischaemia and infarction.
34. Explore mechanism of brain metastasis and difference between brain tumors.

C. Practical/ Professional Skills

1. Regularly attend the classes as possible.
2. Organize and distribute tasks.
3. Work in a team to conduct a specific project.
4. Work independently to conduct a specific project.
5. Recognize anatomical features of the skull, mandible and cervical vertebrae.
6. Display muscles, main blood vessels and nerves of the head and neck specimens and models.
7. Identify the gross morphology of the meninges, cerebrum, cerebellum, brain stem and spinal cord in fresh specimens and models.
8. Identify the arrangement of various parts of the brain in plastinated sections.
9. Perform an examination of different types of sensation.
10. Acquire skills to examine cranial nerves, sensory, motor, vestibular system and cerebellum.
11. Acquire skills to examine visual fields, visual acuity and colour vision.
12. Acquire skills to do hearing tests by tuning fork and audiometer.
13. Acquire skills to examine normal and abnormal brain tissues.
14. Acquire skills to interpret CSF findings.
15. Identify tests for diagnosis of some bacterial, fungal, viral and parasitological infections of the CNS and special senses.
16. Identify the response of experimental animals to local and general anesthetics.
17. Identify the manifestation of drug dependence and acquire the appropriate pharmacological approaches for treatment of drug dependence.
18. Acquire the skill to write the prescriptions and integrate with the drug samples for

different CNS diseases e.g., epilepsy, parkinsonism, psychosis and depression, etc.

D. General and Transferable Skills

The skills of a general nature, which can be applied in any subject area, including written and oral communication, the use of new technological tools, group working, problem solving, management ...etc.

1. Use of information by all means, including electronics.
2. Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.
3. Organize time and resources effectively and set priorities.
4. Discuss their own work and that's of others, using constructive feedback.
5. Communicate effectively, both orally and in writing, with colleagues, patients and family (if possible) and others with whom physicians must exchange information in carrying out their responsibilities.
6. Retrieve (from electronic databases and other resources), manage, and utilize biomedical information for solving problems and making decisions that are relevant to the care of individuals and populations.
7. Analyse and evaluate the source and validity of new basic science information that apply to human biology and the practice of medicine.
8. Translate current clinical and basic information into lay language for patients.
9. Assess online medical information and assist patients and their families with these tools.
10. Gather information not only about the disease but also about the patient's reliefs, concerns and expectations about the illness, while considering the influence of various factors such as the patient's age, gender, ethnic, cultural and socioeconomic background, and spiritual values on that illness.

Learning Methods

1. Lectures for knowledge and intellectual skill outcomes.
2. Practical sessions to gain practical skills aided with the practical book.
3. Cases related to the topics studied in lectures; including libraries, E learning (practical photographs and questions of different topics available online for student's assessments) and consulting professors for gathering information.

Methods for Student Assessment

1. Formative

This is used to monitor student's learning to provide ongoing feedback that can be used by instructors to improve their teaching and by students to improve their learning.

It's given at least once in the form of quizzes that is made available for the students at the E-learning site at the end of the block.

Answers are presented instantly after the attempts and discussed on the students groups or in person with the teaching staff

Questions should be consistent with the level of the final exam. The student's attendance is a condition for entering the summative exams. The electronic or paper achievement file must be used to follow up on the students' evaluation, and its completion is a condition for entering the final exams

2. Summative

It is used to evaluate student's achievements at the end of an instructional unit. The grades tell whether the student achieved the learning goal or not.

The student's performance will be assessed according to the following:

الدور الأول

Assessment task	Type of assessment	Proportion of total assessment	
		%	Marks
End block exam	MCQ	20%	37 marks
Portfolio		10%	18.5 marks
Final written exam	75% MCQ 25%(short answer questions + modified short essay).	40%	75 marks
OSPE Final	Static and dynamic stations	30%	57 marks
Total		100%	187.5 marks

الدور الثاني

Assessment task	Type of assessment	Proportion of total assessment	
		%	Marks
Final written exam	75% MCQ 25%(short answer questions + modified short essay).	60%	112.5 marks
OSPE Final	Static and dynamic stations	40%	75 marks
Total		100%	187.5 marks

Formative Assessment

This is used to monitor student's learning to provide ongoing feedback that can be used by instructors to improve their teaching and by students to improve their learning.

It's given at least once in the form of quizzes that is made available for the students at the E-learning site at the end of the block.

Answers are presented instantly after the attempts and discussed on the students groups or in person with the teaching staff

Questions should be consistent with the level of the final exam. The student's attendance is a condition for entering the summative exams. The electronic or paper achievement file must be used to follow up on the students' evaluation, and its completion is a condition for entering the final exams

Block Evaluation

1. Students' results.
2. Students' feedback.
3. Tutors' feedback.

Block Contents s Blueprint

Lecture number	Week	Lecture title	Department	Mid exam marks	Final exam marks
1	1 st week	Scalp, face and Muscles of the head.	Anatomy	1	1
2	1 st week	Muscles of the neck.	Anatomy	1	1
3	1 st week	Nerves of the head and neck (cranial nerves & cervical plexus).	Anatomy	1	1
4	1 st week	Nerves of the head and neck (cranial nerves & cervical plexus).	Anatomy	1	
5	1 st week	Blood supply and lymphatic of the head and neck.	Anatomy	1	1
6	1 st week	Contents of orbit. Structure of the ear.	Anatomy	2	-
7	1 st week	Meninges.	Anatomy	1	1
8	1 st week	Cerebrum (I).	Anatomy	1	1
9	1 st week	Cerebrum (II).	Anatomy	1	-
10	2 nd week	Neurotransmitters.	Biochemistry	1	1
11	2 nd week	Histological structure of the neurons and neuroglia cells.	Histology	1	—
12	2 nd week	Histological structure of meninges, choroid plexus and different types of brain barriers.	Histology	1	—
13	2 nd week	Cerebral circulation and Physiology of the cerebrospinal fluid.	Physiology	1	—
14	2 nd week	Basic functions of the synapses.	Physiology	2	1
15	2 nd week	Basic functions of the synapses.	Physiology	1	1
16	2 nd week	Somatosensory function.	Physiology	1	1
17	2 nd week	Myelination in PNS and CNS and Types of nerve fibers and nerve endings.	Histology	1	—

18	2 nd week	General and Local Anesthetics.	Pharmacology	1	1
19	2 nd week	Basic Pathology of CNS. Pathology of Cerebrovascular Diseases.	Pathology	2	-
20	2 nd week	Infection of the CNS (Meningitis & encephalitis).	Pathology	1	0
21	3 rd week	Brainstem.	Anatomy	1	1
22	3 rd week	The Ventricular System and Cerebrospinal Fluid.	Anatomy	1	-
23	3 rd week	Blood supply of the brain.	Anatomy	1	1
24	3 rd week	Cerebellum.	Anatomy	-	1
25	3 rd week	Physiology of pain (I).	Physiology	1	1
26	3 rd week	Physiology of pain (II).	Physiology	1	1
27	3 rd week	Opioids.	Pharmacology	1	1
28	3 rd week	Antidepressants.	Pharmacology	1	-
29	3 rd week	Stretch reflex (I)	Physiology	1	1
30	3 rd week	Stretch reflex (II)	Physiology	1	1
31	4 th week	The Visual pathway.	Anatomy	-	1
32	4 th week	Auditory & Vestibular Pathways. Taste & olfactory pathways.	Anatomy	-	1
33	4 th week	Histological structure of the cerebral and cerebellar cortices.	Histology	1	1
34	4 th week	Histological structure of the eye and its accessory structures.	Histology	-	2
35	4 th week	Sensory and motor areas of the cerebral cortex (I).	Physiology	1	1
36	4 th week	Sensory and motor areas of the cerebral cortex (II).	Physiology	1	1
37	4 th week	Neurodegenerative and Demyelinating diseases.	Pathology	0	1
38	4 th week	Helminths that cause CNS diseases (I).	Parasitology	-	1
39	4 th week	Encephalitis, brain abscess and prion disease.	Microbiology	-	1
40	4 th week	Meningitis.	Microbiology	-	2

41	5 th week	Helminths that cause CNS diseases (II).	Parasitology	-	1
42	5 th week	Protozoa that may cause CNS diseases.	Parasitology	-	2
43	5 th week	Tetanus, Botulism.	Microbiology	-	2
44	5 th week	Spinal cord.	Anatomy	1	1
45	5 th week	Spinal cord.			
46	5 th week	Intellectual Functions of the Brain, Physiology of speech.	Physiology	-	1
47	5 th week	Cerebellum (functions).	Physiology	-	2
48	5 th week	Functions of the vestibular apparatus.	Physiology	-	2
49	5 th week	Antiparkinsonian drugs.	Pharmacology	-	2
50	5 th week	Physiology of the Basal Ganglia.	Physiology	-	1
51	6 th week	The Limbic system.	Physiology	-	1
52	6 th week	Reticular activating system and Wakefulness.	Physiology	-	1
53	6 th week	Hypnotics and Anxiolytics	Pharmacology	-	1
54	6 th week	Anticonvulsants.	Pharmacology	-	2
55	6 th week	Tumours of the CNS (I).	Pathology	-	2
56	6 th week	Tumours of the CNS (II).	Pathology	-	2
57	6 th week	Brain Metabolism	Biochemistry	-	2
58	6 th week	Antipsychotics.	Pharmacology	-	1
59	6 th week	Development of the nervous system.	Anatomy	-	2
60	6 th week	Physiology of sleep.	Physiology	-	1
61	7 th week	Functions of different parts of the eye.	Physiology	-	1
62	7 th week	The optical system of the eye.	Physiology	-	1
63	7 th week	The visual process.	Physiology	-	2
64	7 th week	Light- dark adaptation cycle and color vision.	Physiology	-	1
65	7 th week	Parasitic infections of the eye.	Parasitology	-	1
66	7 th week	Poliomyelitis and rabies. Infections of the eye and the ear.	Microbiology	-	2
67	7 th week	Histological structure of sensory organs of hearing, balance, taste and smell.	Histology	-	2

S:	68	7th week	Hearing mechanisms (I).	Physiology	-	1
	69	7th week	Hearing mechanisms (II).	Physiology	-	1
	70	7th week	Chemosensory functions.	Physiology	-	1
	Total	70 lectures				

B. Practical Sessions (8 hours / week, 4 sections)

Experiment number	Week	Laboratory name	Department
1	1 st week	Skull.	Anatomy
2	1 st week	Skull and cervical vertebrae.	Anatomy
3	1 st week	Muscles of the head.	Anatomy
4	1 st week	Neck. Blood supply of the head and neck.	Anatomy
1	2 nd week	Orbit and ear.	Anatomy
2	2 nd week	Meninges and brain ventricles.	Anatomy
3	2 nd week	Blood supply of the brain.	Anatomy
4	2 nd week	Slide demonstration and examination of: Nerve trunk (Hx&E Osmic acid), Spinal ganglion (Hx&E). Cervical spinal cord.	Histology
1	3 rd week	Brainstem, attachments of cranial nerves and spinal cord.	Anatomy
2	3 rd week	Somatosensory function.	Physiology
3	3 rd week	Local and general Anesthetics.	Pharmacology
4	3 rd week	Drug dependence.	Pharmacology
1	4 th week	Cerebral hemispheres.	Anatomy
2	4 th week	Spinal reflexes.	Physiology
3	4 th week	Transverse sections of the brain.	Anatomy
4	4 th week	Coronal sections of the brain.	Anatomy
1	5 th week	Slide demonstration and examination of: Cerebral cortex. Brain stems (midbrain, pons, and medulla oblongata). Cerebellum.	Histology
2	5 th week	Cerebellum.	Anatomy

3	5 th week	Cerebellum and vestibular apparatus examinations.	Physiology
4	5 th week	Lumbar puncture & Lab diagnosis of microbial infections of the CNS.	Microbiology
1	6 th week	Lab diagnosis of microbial infections of the CNS.	Microbiology
2	6 th week	Slide demonstration of: - Schwannoma. - Meningioma.	Pathology
3	6 th week	Gross demonstration of specimens of intracranial hemorrhage and examples of brain tumors.	Pathology
4	6 th week	Antiepileptics, antidepressant antipsychotics and antiparkinsonian drugs (samples, prescriptions).	Pharmacology
1	7 th week	Slide demonstration and examination of: Eye: Cornea, iris, retina, eye lid & lacrimal gland. Organ of Corti. Taste buds.	Histology
2	7 th week	Visual system examination.	Physiology
3	7 th week	Hearing tests.	Physiology
4	7 th week	Parasitic infections of the brain and eye.	Parasitology

B. Case- based Group Discussion (5 hours/ week)

Cases	Week	Section name	Department
1	1 st week	Fracture of the skull base. Cephalohematoma. Epidural hematoma.	Anatomy (60 min)
2	1 st week	Trigeminal nerve injury (trigeminal neuralgia).	Anatomy (60 min)
3	1 st week	Injury of the facial nerve.	Anatomy (60 min)
4	1 st week	Hypoglossal nerve and oculomotor nerve injuries	Anatomy (60 min)
5	1 st week	Branchial arches development (Cleft lip)- Torticollis.	Anatomy (60 min)
1	2 nd week	Schizophrenia (glutamate hypothesis of schizophrenia)	Biochemistry (60 min)
2	2 nd week	Depression.	Biochemistry (60 min)
3	2 nd week	Depression.	Pharmacology (60 min)
4	2 nd week	Stroke & Hydrocephalus.	Pathology(60 min)
5	2 nd week	Cerebral arteries-stroke	Anatomy (60 min)

1	3 rd week	Headache.	Physiology (30 min)
		Migraine.	Pharmacology (30 min)
2	3 rd week	Thalamic syndrome.	Physiology (30 min)
		Upper and lower motor neuron lesions.	Physiology (30 min)
3	3 rd week	Chronic pain.	Physiology (60 min)
4	3 rd week	Drug dependence.	Pharmacology (60 min)
5	3 rd week	Lesions of different motor and sensory of areas of the cerebral cortex.	Physiology (60 min)
1	4 th week	Meningitis.	Pathology (30 min)
		Cerebral abscess.	Pathology (30 min)
2	4 th week	Transection of the spinal cord (complete, hemi-, quadrant transections).	Physiology (60 min)
3	4 th week	Syringomyelia	Anatomy (60 min)
4	4 th week	Parasitic infections that cause space occupying lesions of the brain.	Parasitology (60 min)
5	4 th week	Parasitic infections of the eye.	Parasitology (60 min)
1	5 th week	Neural tube defects. Cerebellum development	Anatomy (60 min)
2	5 th week	Aphasia and dysarthria	Physiology (30 min)
		Demyelinating diseases.	Physiology (30 min)
3	5 th week	Ataxia.	Physiology (30 min)
		Vertigo.	Physiology (30 min)
4	5 th week	Parkinsonism, athetosis, hemiballismus, chorea.	Physiology (60 min)
5	5 th week	Tetanus, botulism, Rabies, Poliomyelitis and prion diseases.	Microbiology (60 min)
1	6 th week	Alzheimer disease & Parkinson diseases.	Pathology (60 min)
2	6 th week	Multiple Sclerosis.	Pathology (60 min)
3	6 th week	Epilepsy	Pharmacology (30 min)
		Alzheimer disease.	Pharmacology (30 min)
4	6 th week	CNS tumors.	Pathology (60 min)
5	6 th week	CNS tumors.	Pathology (60 min)

1	7th week	Corneal abrasion, clinical cases about abnormalities in neurons, glial cells and synapses.	Histology (60 min)
2	7th week	Visual field defects.	Anatomy (60 min)
3	7th week	Meningoencephalitis	Microbiology (30 min)
		Otitis media and conjunctivitis	Microbiology (30 min)
4	7th week	Errors of refraction, and Night blindness.	Physiology (30 min)
		Color blindness and glaucoma	Physiology (30 min)
5	7th week	Deafness.	Physiology (60 min)

Study Resources

1. Lecture Notes

2. Books:

Physiology department:

1. Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland.
2. Integrated systems.
3. Integrated medical sciences.
4. Case files Neuroscience.
5. Case files Physiology.
6. Case files Neurology.

Anatomy department:

1. Oxford handbook of medical sciences.
2. Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland.
3. Integrated anatomy and embryology
4. First aid for the basic sciences (organ systems).
5. First Aid USMLE.
6. Kaplan Medical USMLE Step 1 Lecture Notes 2008.
7. Case Files Anatomy
8. First Aid QCA USMLE step 1.
9. Case files neuroscience
10. Neuroscience Pretest

Pharmacology department:

1. FIRST AID for the Basic Science, Organ Systems Third Edition.
2. Basic and clinical pharmacology; B.G. Katzung 10th edition, McGraw Hill.
3. Lippincott Illustrated Reviews: Pharmacology, Sixth Edition.

Histology department:

1. Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and

Peter Shortland.

2. The nervous system, basic science and clinical conditions, second edition.
3. Case files Neuroscience.
4. First aid for the USMLE STEP 1

Pathology department:

1. Elsevier's integrated pathology.
2. Escourrolle C Poirier Manual of Basic Neuropathology.
3. Tao Le et al. (2017).
4. Robbins Basic Pathology 10th edition (2018).
5. Case File pathology, 2nd edition.
6. First AID Cases for the USMLE Step 1 3rd edition.
7. Robbins C Cotran Review of Pathology 4th edition.

Microbiology department:

1. USMLE Step 1 Kaplan Lecture Notes 2020 Immunology and Microbiology.
2. YALE-G First Aid: CRUSH USMLE, Step 2 CK and Step 3.
3. Pretest Microbiology.
4. First Aid QCA.

Parasitology department:

1. First aid for USMLE step 1. student to student guide 2019.
 2. Oxford handbook of Medical Sciences 2011.
 3. Garcia, Lynne Shore, and David A Bruckner. Diagnostic Medical Parasitology. New York: Elsevier, 2016.
- Cases in Human Parasitology Judith S. Heelan Washington, DC press, 2004.

Biochemistry department:

1. First aid for USMLE step 1 (2019).
2. Lippincott illustrated reviews integrated systems.
3. The nervous system, basic science and clinical conditions, second edition.
4. Textbook of medical biochemistry 8th edition.

A. Lecture topics and their intended learning outcomes

Lecture (1): Scalp, face and Muscles of the head (Anatomy)

By the end of the lecture the student will be able to:

A.4 Recognize the layers of the scalp.

A.4 List the muscles of the facial expressions and their nerve supply.

A.4 List the muscles of mastication, tongue, soft palate, pharynx and larynx and define their nerve supply.

A.4 Describe the articulation of temporomandibular joint (type, bones, ligaments and movements).

B.4 Elucidate the clinical presentation of scalp injuries (lacerations and hemorrhage based on the anatomical facts).

B.4 Explain the manifestation of facial nerve injury on the basis of anatomical facts.

NARS: 4.1, 4.3

Lectures (2): Muscles of the neck (Anatomy)

By the end of the lecture the student will be able to:

A.3 List the muscles of the neck and describe the sternocleidomastoid muscle as an important landmark.

A.3 Describe the boundaries and enumerates contents of the anterior and posterior triangles of the neck.

A.3 Identify structures in the midline of the neck.

B.3 Correlate anatomical facts with the manifestations of some congenital anomalies of the head and neck (torticollis, branchial fistula), complete injury of brachial plexus and spinal accessory nerve injury in the neck.

NARS: (4.1, 4.3)

Reference book:

Oxford handbook of medical sciences, pp. 696.

Lecture (3): Nerves of head and neck (cranial nerves s cervical plexus) (Anatomy)

By the end of the lecture the student will be able to:

A.5 List the cranial nerves and identify briefly, component fibers, peripheral distribution, function of each nerve. The main signs of injury.

B.5 Explain the signs of cranial nerves injury based on anatomical facts.

NARS: (4.1, 4.2)

Reference book:

Oxford handbook of medical sciences, pp. 702-705.

Lecture (4): Nerves of the head and neck (cranial nerves s cervical plexus) (Anatomy)

By the end of the lecture the student will be able to:

A.5 List the cranial nerves and identify briefly, component fibers, peripheral distribution, function of each nerve. The main signs of injury.

A.5 Describe the formation and branches of the cervical plexus.

B.5 Explain the signs of cranial nerves injury based on anatomical facts.

B.5 Distinguish the difference in clinical manifestations between upper and lower lesion of the facial nerve.

NARS: (4.1, 4.3)

Reference book:

Oxford handbook of medical sciences, pp. 702-705.

Lectures (5): Blood supply and lymphatic of the head and neck (Anatomy)

By the end of the lecture the student will be able to:

A.8 List and describe briefly the course of the main arteries, veins, and major lymph nodes in the head and neck.

A.8 Describe the Dural venous sinuses and know the anatomy of the cavernous sinus.

B.8 Correlate and Interpret the knowledge of the distribution of the veins in understanding the signs of cavernous sinus thrombosis.

B.8 Demonstrate the dangerous area of the face.

NARS: (4.1, 4.3)

Reference books:

Oxford handbook of medical sciences, pp. 694-695.

First aid for the basic sciences (organ systems): chapter 6 (dural venous sinuses), pp. 424- 425.

Lectures (6): Contents of orbit (Anatomy)

By the end of the lecture the student will be able to:

A.6 List the contents of the orbit.

A.6 List the muscles of the eye (intraocular and extraocular muscles).

A.6 Discern the gross structure and layers of the eye in coronal section and define its nerve and blood supply.

A.6 Describe on a diagram the anatomy of the eyelids and lacrimal apparatus.

B.6 Correlate anatomical facts with the manifestations of various nerve injuries of the orbit.

B.6 Interpret anatomical facts with its major clinical applications: e.g., ocular manifestations of increased intracranial pressure.

NARS: (4.1, 4.3)

Reference book:

Oxford handbook of medical sciences, pp. 699 C 706.

Lecture (6): Structure of the ear (Anatomy)

By the end of the lecture the student will be able to:

A.7 Describe the anatomy of the external auditory meatus and tympanic membrane.

A.7 Identify the boundaries and contents of the middle ear.

A.7 Know the parts of the inner ear.

B.7 Correlates anatomical facts concerning the relation of the middle ear to the middle cranial fossa in cases of fracture of base of the skull and infections of middle ear.

B.7 Explain the relation between chorda tympani nerve and tympanic membrane.

NARS: (4.1, 4.3).

Reference book:

Oxford handbook of medical sciences, pp. 708-709.

Lectures (7): Meninges (Anatomy)

By the end of the lecture the student will be able to:

A.2 Describe the normal anatomy of meninges.

A.2 List various dural folds.

A.2 List and describe the structures involved in the production, circulation, and reabsorption of cerebrospinal fluid.

NARS: (4.1, 4.3).

Reference book:

First aid for the basic sciences, organ systems: chapter 6, pp. 419-421. Oxford handbook of medical sciences, pp. 690-691.

Lecture (8): Cerebrum (I) (Anatomy)

By the end of the lecture the student will be able to:

A.12 List the sulci and gyri of the lobes of the cerebrum.

A.12 Define the lobes of the cerebral hemisphere.

A.12 List the main cortical areas on the cerebral cortex.

A.12 Describe the components of the cerebrum.

B.12 Interpret anatomical facts with its major clinical applications (vascular injuries of the cerebral cortex).

NARS: (4.1, 4.3).

Reference book:

First aid for the basic sciences (organ systems): chapter 6, pp.:425-463.

Lecture (G): Cerebrum (II) (Anatomy)

By the end of the lecture the student will be able to:

A.12 Name the parts of the diencephalon.

A.12 Describe the anatomy of the thalamus and hypothalamus.

A.12 Enumerate the components of the basal ganglia.

A.12 Enumerate the components of the limbic system.

A.12 List types of white matter fibers, including the internal capsule and corpus callosum (parts and its blood supply).

B.12 Interpret anatomical facts with its major clinical applications (vascular injuries of basal ganglia and internal capsule).

NARS: (4.1, 4.3).

Reference book:

First aid for the basic sciences (organ systems): chapter 6, pp.:425-463.

Lecture (10): Neurotransmitters (Biochemistry)

By the end of the lecture the student will be able to:

- A.1 Define neurotransmitters.
- A.1 Describe classification of neurotransmitters.
- A.1 Describe properties of neurotransmitters
- A.1 List types of neurotransmitter receptors.
- A.1 Describe acetylcholine synthesis, release, binding to the postsynaptic receptors, and removal from synaptic cleft.
- A.1 Describe catecholamine (dopamine, epinephrine, norepinephrine) synthesis and degradation.
- A.1 Describe serotonin synthesis and breakdown.

NARS: (4.2; 4.3)

Reference books:

The nervous system, basic science and clinical conditions, second edition, pp. 4146.

Lecture (11): Histological structure of the neurons, synapses and neuroglial cells (Histology)

By the end of the lecture the student will be able to:

- A.1 **Mention** the different types of neurons and nerve fibers in the body.
- A.1 **Describe** the structure of neurons and nerves.
- B.1 **Identify** different types, structure and function of neuroglia.

NARS: (4.1, 4.2).

Reference books:

Integrated systems (pp. 55 C56), The nervous system (pp. 32-36), Basic Histology (pp. 161-170).

Lecture (12): Histological structure of meninges, choroid plexus and different types of brain barriers (Histology)

By the end of the lecture the student will be able to:

- A.3. **Define** the meninges
- A.3 **Mention** the different types of meninges and their structure.
- B.3 **Explain** the structure and importance of choroid plexus.
- B.3 **Describe** the different brain barriers.

NARS: (4.1, 4.2).

Reference books: Integrated systems (pp.51), The nervous system (pp.24) C Basic Histology (pp. 176-183).

Lectures (13): Cerebral circulation and physiology of cerebrospinal fluid (Physiology)

By the end of the lecture the student will be able to:

B.1 Recognize mechanism of regulation and auto regulation of cerebral blood flow.

B.1 Explain the effect of brain activity on cerebral blood flow.

A.1 Identify formation, flow and absorption of cerebral fluid.

A.1 List functions of CSF.

B.1 Recognize the blood brain barrier.

B.1 Describe mechanism of transport of substances across blood brain barrier.

B.1 Recognize factors influencing the intracranial pressure.

B.1 Explain mechanisms of brain edema.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 51; 57; 62, 62f; 7576; 112; 200; 201; 234.

Lectures (14): Basic functions of the synapses (Physiology)

By the end of the lecture the student will be able to:

A.3 Identify the basic functional unit of the CNS.

A.3 Recognized functions of afferent, interneuron and efferent neurons.

A.3 Compare chemical and electrical synapses and **summarize** the mechanism of their actions.

A.3 Explore steps of chemical synaptic transmission.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 40-41.

Lectures (15): Basic functions of the synapses (Physiology)

By the end of the lecture the student will be able to:

A.3 Recognize different types of pre- and post-synaptic potentials.

B.3 Explain the mechanisms of pre- and post-synaptic potentials.

A.3 Differentiate between synaptic potential and action potential.

B.3 Design the mechanism and types of synaptic inhibitions.

A.3 Recognize the types of summation of postsynaptic potentials.

A.3 Know factors affecting synaptic transmissions.

A.3 Summarize functions of commonest neurotransmitters in the CNS.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 40-41.

Lecture (16): Somatosensory functions (Physiology)

By the end of the lecture the student will be able to:

A.4 Identify the basic principles of sensory physiology (receptors, transduction of sensory stimuli into nerve impulses and receptor potential).

A.4 Describe briefly submodalities of tactile sensation and associated receptors.

A.4 Define adequate stimulus, sensory threshold, receptive field and adaptation of receptors.

A.4. Identify the inverse relationship between sensitivity and threshold.

B.4 Explain transduction mechanisms for mechanical and thermal stimuli.

B.4 Distinguish mechanisms of adaptation and classifications of the receptors according to adaptation (dynamic and static).

B.4 Compare crude and fine tactile sensation.

B.2 Explain information encoding by the CNS, stimulus strength, duration and location.

B.4 Differentiate topographic representation vs population encoding.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 21-22, 21t, 22f; 53-54; 65; 66; 70-71.

Lecture (17): Myelination in PNS and CNS and Types of nerve fibers and nerve endings (Histology)

By the end of the lecture the student will be able to:

A.2 Identify the mechanisms of myelination in peripheral and CNS.

A.2 Compare between myelination in peripheral and CNS.

A.2 Mention the characters of different types of sensory and motor nerve endings.

NARS: (4.1, 4.2)

Reference books:

Integrated systems (p.5255), The nervous system (pp. 22, 23, 34 C35) C Basic Histology (pp.174-185).

Lecture (18): General and Local anaesthetics (Pharmacology)

By the end of the lecture the student will be able to:

A.1G Describe local and general anesthetics.

A.1G List local anesthetics and general anesthetics .

A.1G Recognize adverse effects of local and general anesthetics .

A.1G Describe mechanism of action of local and general anesthetics.

NARS: (1.17; 4.2).

References books:

First Aid for the Basic Sciences: Organ Systems, Tao Le et al., 3rd edition pp. 545-547.

Lippincott's Illustrated Reviews: Pharmacology, 4th Edition. Chapter 11. pp. 127-140.

Lecture (1G): Basic pathology and Cerebrovascular Diseases of CNS (Pathology)

By the end of the lecture the student will be able to:

A.1 Summarize basic cellular lesions of the CNS.

A.1 Mention definition, causes, types C effects of hydrocephalus.

A.1 Outline types C causes of cerebral edema.

B.1 Summarize causes, effects & complications of ↑ICP (brain herniation).

NARS: (4.1,4.2,4.3).

Reference books:

Tao Le et al. (2017) (pp. 488, 469-473, 503).

Elsevier's integrated pathology (2007) (pp. 337-338, 340).

Escourrolle & Poirier Manual of Basic Neuropathology (2004) (pp. 120).

Lecture (20): Infections of CNS (meningitis and encephalitis) (Pathology)

By the end of the lecture the student will be able to:

A.3 Define meningitis C encephalitis.

A.3 List routes of CNS infection.

A.3 Outline different types of meningitis.

A.3 Identify morphological changes of suppurative meningitis.

B.3 Explore complication of meningitis.

B.3 Compare between pyogenic C Aseptic meningitis.

A.3 Describe types, morphology C complications of brain abscess.

NARS: (4.1,4.2,4.3).

Reference books:

Robbins Basic Pathology 10th edition (2018). (pp. 862-865).

Elsevier's integrated pathology (2007) (pp. 343-344).

Lecture (21): Brain stem (Anatomy)

By the end of the lecture the student will be able to:

A.11 Describe the structure of the mesencephalon.

A.11 Describe the structure of the rhombencephalon.

B.11 Recognize the cranial nerve nuclei in the brain stem.

NARS: (4.1, 4.2).

Reference book:

First aid for the basic sciences (organ systems): chapter 6, pp. 441-442C444-445.

Oxford handbook of medical sciences, pp. 412.

Lectures (22): The Ventricular System and Cerebrospinal Fluid (Anatomy)

By the end of the lecture the student will be able to:

A.2 List and describe the structures involved in the production, circulation, and reabsorption of cerebrospinal fluid.

A.2 Describe brain ventricles.

A.2 Describe briefly the circulation of CSF.

B.2 Understand some clinical situations such as hydrocephalus and increased intracranial pressure in tumors of the ventricles.

NARS: (4.1, 4.2).

Reference book:

First aid for the basic sciences, organ systems: chapter 6, pp. 419-421.

Lectures (23): Blood supply of the brain (Anatomy)

By the end of the lecture the student will be able to:

A.G Identify the blood supply of the brain.

A.G Describe the circle of Willis.

A.G List the main arterial supply for different parts of the brain (cerebral cortex, internal capsule, basal ganglia, diencephalon).

B.G Correlate and Interpret knowledge of the distribution of the arterial supply of the brain for understanding stroke, cerebral aneurysms and intracranial hemorrhages.

NARS: (4.1, 4.3).

Reference book:

First aid for the basic sciences (organ systems): chapter 6, pp. 422-423.

Lecture (24): Cerebellum (Anatomy)

By the end of the lecture the student will be able to:

A.13 Describe the anatomy of the cerebellum (position, parts, nuclei, blood supply)

B.13 Interpret anatomical facts with its major clinical applications (cerebellar vascular lesions and ataxia).

NARS: (4.1,4.3).

Reference book:

First aid for the basic sciences (organ systems): Chapter # 6, pp. 437-438.

Lecture (25): Physiology of pain (I) (Physiology)

By the end of the lecture the student will be able to:

A.5 Define pain.

A.5 Identify nociceptors (location, categorization and adequate stimulus).

B.5 Explain mechanisms of pain sensory transduction.

A.5 Define hyperalgesia and **List** the differences between primary and secondary hyperalgesia.

B.5 Compare fast and slow pain.

B.5 Know classification of pain.

B.5 Differentiate allodynia from hyperalgesia.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 65; 80-93.

Lecture (26): Physiology of pain (II) (Physiology)

By the end of the lecture the student will be able to:

B.5 Distinguish mechanism of referred pain.

B.5 Explain mechanisms of peripheral and central pain inhibition.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 65; 80-93.

Lecture (27): Opioids (Pharmacology)

By the end of the lecture the student will be able to:

A.18 List the uses, adverse effects and contraindications of opioid analgesics.

A.18. Describe the pharmacodynamics of opioid analgesics

A.18. Describe pharmacokinetic properties of opioid analgesics

A.18. Describe the manifestation and the management of morphine toxicity

NARS: (4.2, 4.3)

References books:

FIRST AID for the Basic Science, Organ Systems Third Edition, pp. 530-531.

Basic and clinical pharmacology; B.G. Katzung 10th edition McGraw Hill, pp. 489-507.

Lippincott Illustrated Reviews: Pharmacology, Sixth Edition, pp. 191-202.

Lecture (28): Antidepressants (Pharmacology)

By the end of the lecture the student will be able to:

A.6 Identify classification of antidepressants.

A.6 List the uses and adverse effects of antidepressants.

B.6 Explain the mechanism of action of antidepressants.

B.6 Predict drug interaction of antidepressants.

NARS: (4.2, 4.3).

Ref. books:

FIRST AID for the Basic Science, Organ Systems Third Edition, pp. 531-535.

Basic and clinical pharmacology; B.G. Katzung 10th edition McGraw Hill, pp. 475-487.

Lippincott Illustrated Reviews: Pharmacology, Sixth Edition, pp. 135-143.

Lecture (2G): Physiology of pain (I) (Physiology)

By the end of the lecture the student will be able to:

A.5 Define pain.

A.5 Identify nociceptors (location, categorization and adequate stimulus).

B.5 Explain mechanisms of pain sensory transduction.

A.5 Define hyperalgesia and **List** the differences between primary and secondary hyperalgesia.

B.5 Compare fast and slow pain.

B.5 Know classification of pain.

B.5 Differentiate allodynia from hyperalgesia.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 65; 80-93.

Lecture (30): Stretch reflex (II) (Physiology)

A.6 Enumerate supraspinal control of stretch reflex.

A.6 Explain the functions and importance of Golgi tendon organs.

B.6 Differentiate between muscle tone and tendon jerk.

B.6 Explore role of gamma efferent discharge.

B.6 Compare stretch and inversed stretch reflex.

B.6 Construct causes of abnormal muscle tone.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 24; 40; 53; 76; 161; 163-169; 167; 172-173.

Lecture (31): The Visual pathway (Anatomy)

By the end of the lecture the student will be able to:

A.16 Recognize the components of the visual pathway.

B.16 Explain the effect of injury and the clinical manifestations of it at various levels of the visual pathway on anatomical basis.

NARS: (4.1, 4.2).

Reference book:

First aid for the basic sciences (organ systems): chapter 6, pp. 459.

Lecture (32): Auditory and Vestibular pathways Taste s olfactory pathways (Anatomy)

By the end of the lecture the student will be able to:

A.17 Recognize the components of the auditory and vestibular pathway.

B.17 Explain the effect of injury and the clinical manifestations of it at various levels of the auditory pathway on anatomical basis.

A.18 Recognize the components of the olfactory and gustatory pathway.

B.18 Explain the effect of injury and the clinical manifestations of it at various levels of the pathway on anatomical basis.

NARS: (4.1, 4.2).

Reference book:

First aid for the basic sciences (Organ Systems): Chapter 6, pp. 461-464.

Lecture (33): Histological structure of the cerebral and cerebellar cortex (Histology)

By the end of the lecture the student will be able to:

A.5 Describe the cytoarchitecture of the cerebellum.

B.5 Explain the cytoarchitecture of the cerebral cortex.

NARS: (4.1, 4.2).

Reference books:

Integrated systems (pp.55-90) Basic histology (pp. 174-179).

Lecture (34): Histological structure of the eye and its accessory structures (Histology)

By the end of the lecture the student will be able to:

A.6 Explain the histological structure of the eyeball.

A.6 Describe the ultrastructure of the retinal photoreceptors' rods, cones and pigmented epithelium.

B.6 Describe the histological structure of accessory organs of the eye.

NARS: (4.1, 4.2)

Reference books:

Integrated systems (pp. 83 C 84), Basic Histology (pp.479-495) and Ross Pawlina Histology (pp. 988).

Lectures (35): Sensory and motor areas of the cerebral cortex (I) (Physiology)

By the end of the lecture the student will be able to:

A.7 Describe briefly functional areas of cerebral cortex (motor, sensory) concerning location, connection, body representation and functions.

B.7 Explain neurological manifestation and correlate them to the defective areas of the cerebral cortex.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus. and Peter Shortland pp. 54-55; 65-83; 14G; 167-172; 174-175.

Lectures (36): Sensory and motor areas of the cerebral cortex (II) (Physiology)

By the end of the lecture the student will be able to:

A.7 Describe briefly high order association cortical areas concerning location, connection, body representation and functions.

B.7 Explain neurological manifestation and correlate them to the defective areas of the cerebral cortex.

B.7 Identified functions of different ascending and descending tracts.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus. and Peter Shortland pp. 54-55; 65-83; 149; 167-172; 174-175.

Lecture (37): Neurodegenerative and demyelinating diseases (Pathology)

By the end of the lecture the student will be able to:

A.4 Mention common Pathologic features C classification of neurodegenerative Ds.

A.4 Summarize pathogenesis of Alzheimer Ds.

A.4 Describe macroscopic C microscopic features of Alzheimer Ds.

A.4 Summarize pathogenesis of Parkinson Ds

A.4 Mention morphologic changes of Parkinson Ds.

A.4 Define s Classify demyelinating diseases.

A.4 Identify pathogenesis C morphology of multiple sclerosis.

NARS: (4.1; 4.2; 4.3).

Reference books:

Robbins Basic Pathology 10th edition (2018). (pp. 870-

879). Tao Le et al. (2017) (ppt. 480-487).

Elsevier's integrated pathology (2007) (pp.345 348, 344).

Lecture (38): Helminths causing CNS diseases (I) (Parasitology)

By the end of the lecture the student will be able to:

A.2 List the most common helminths causing CNS diseases.

A.2 Recall and differentiate the infective and diagnostic stages of each parasite.

A.2 Identify mode of infection of each parasite.

B.2 Demonstrate the pathological lesions in the brain caused by each parasite.

B.2 Explain host-parasite relationships (pathogenesis and main clinical presentations of each parasite).

B.2 Describe laboratory diagnosis, imaging and pathological studies of lesions caused by these parasites and **Recall** treatment and prevention of them

NARS: (1.1, 2.1, 2.6, 4.1, 4.2, 4.3).

Reference books:

Lecture notes

First aid for USMLE step 1. Student to student guide 2019. Pages: 158, 159, 160, 161, 226, 383, 588, 665

Oxford handbook of Medical Sciences 2011. Pages: 810, 819

Garcia, Lynne Shore, and David A Bruckner. Diagnostic Medical Parasitology. New York: Elsevier, 2016.

Lecture (3G): Encephalitis, Brain abscess and prion disease (Microbiology)

By the end of the lecture the student will be able to:

A.1 Define encephalitis.

A.1 List infectious causes of encephalitis.

A.1 Differentiate the morphological characteristics and **Identify** the mode of infection of some pathogens.

A.2 Memorize the causative agent of each disease and its morphological characteristics.

A.2 Identify the mode of infection for each pathogen.

B.2 Demonstrate host parasite relationships (pathogenesis) of each disease.

B.2 Explain the main clinical presentations of each disease.

B.2 Describe laboratory diagnosis and prevention of each disease.

B.1 Demonstrate host-parasite relationships (pathogenesis) and **Explain** the main clinical presentations of these pathogens.

B.1 Describe laboratory diagnosis and prevention of these pathogens.

NARS: (1.6, 1.8, 2.4, 2.5, 2.6, 4.1, 4.2, 4.3).

Reference books:

YALE-G First Aid: Crush USMLE, Step 2CK and Step 3 (page 52, 54).

Elsevier's Integrated Review Immunology and Microbiology (page 120, 131, 132, 134, 135).

Lecture (40): Meningitis (Microbiology)

By the end of the lecture the student will be able to:

A.1 Define meningitis.

A.1 List infectious causes of meningitis.

A.1 Differentiate the morphological characteristics and **Identify** the mode of infection of some pathogens.

B.1 Demonstrate host-parasite relationships (pathogenesis) and **Explain** the main clinical presentations of these pathogens.

B.1 Describe prevention of these pathogens.

NARS: (1.6, 1.8, 2.4, 2.5, 2.6, 4.1, 4.2, 4.3).

Reference books:

YALE-G First Aid: Crush USMLE, Step 2CK and Step 3 (page 55, 98).

Elsevier's Integrated Review Immunology and Microbiology (page 105, 106, 107, 132, 134, 145).

Lecture (41): Helminths causing CNS diseases (II) (Parasitology)

By the end of the lecture the student will be able to:

A.2 List the most common helminths causing CNS diseases.

A.2 Recall and differentiate the infective and diagnostic stages of each parasite.

A.2 Identify mode of infection of each parasite.

B.2 Demonstrate the pathological lesions in the brain caused by each parasite.

B.2 Explain host-parasite relationships (pathogenesis and main clinical presentations of each parasite).

B.2 Describe laboratory diagnosis, imaging and pathological studies of lesions caused by these parasites and **Recall** treatment and prevention of them

NARS: (1.8, 2.4, 2.5, 2.6, 4.1, 4.2, 4.3).

Reference books:

Lecture notes

First aid for USMLE step 1. Student to student guide 2019. Pages: 158, 159, 160, 161, 226, 383, 588, 665

Oxford handbook of Medical Sciences 2011. Pages: 810, 819

Garcia, Lynne Shore, and David A Bruckner. Diagnostic Medical Parasitology. New York: Elsevier, 2016.

Lecture (42): Protozoa causing CNS diseases (II) (Parasitology)

By the end of the lecture the student will be able to:

A.1 List the most common protozoa causing CNS diseases.

A.1 Recall and differentiate the infective and diagnostic stages of each parasite.

A.1 Identify mode of infection of each parasite.

B.1 Demonstrate the pathological lesions in the brain caused by each parasite.

B.1 Explain host-parasite relationships (pathogenesis and main clinical presentations of each parasite).

B.1 Describe laboratory diagnosis, imaging and pathological studies of lesions caused by these parasites and **Recall** treatment and prevention of them.

NARS: (1.8, 2.4, 2.5, 2.6, 4.1, 4.2, 4.3).

Reference books:

Lecture notes.

First aid for USMLE step 1. Student to student guide 2019. Pages: 79, 156, 157, 177, 180, 182, 198, 200, 309, 414, 416, 417, 679, 683, 684.

Oxford handbook of Medical Sciences 2011. Pages: 138, 818, 819, 820, 863, 922. Garcia, Lynne Shore, and David A Bruckner. Diagnostic Medical Parasitology. New York: Elsevier, 2016.

Lecture (43): Tetanus and Botulism (Microbiology)

By the end of the lecture the student will be able to:

A.3 Define each disease.

A.3 Memorize the causative agent of each disease and its morphological characteristics.

A.3 Identify the mode of infection for each pathogen.

B.3 Demonstrate host parasite relationships (pathogenesis) of each disease.

B.3 Explain the main clinical presentations of each disease.

B.3 Describe laboratory diagnosis and prevention of each disease.

NARS: (1.6, 1.8, 2.4, 2.5, 2.6, 4.1, 4.2, 4.3).

Reference books:

YALE-G First Aid: Crush USMLE, Step 2CK and Step 3 (page 93,557). Elsevier's Integrated Review Immunology and Microbiology (page 111,117,136).

Lectures (44 s 45): Spinal cord (Anatomy)

By the end of the lecture the student will be able to:

A.10 Describe the anatomy of the spinal cord.

A.10 Describe the normal anatomy of the main ascending (sensory) and descending (motor) tracts.

B.10 Interpret anatomical facts with the clinical manifestations of some vascular lesions (anterior spinal artery infarction and cauda equina and conus medullaris syndromes).

B.10 Interpret anatomical facts with the clinical manifestations of some vascular lesions (anterior spinal artery infarction and cauda equina and conus medullaris syndromes).

B.10 Correlate the anatomy of the spinal cord with the lumbar puncture procedure (level and structures that the needles pass through).

B.10 Correlate anatomical facts with the injury of spinal cord and vertebral column.

NARS: (4.1, 4.3).

Reference book:

First aid for the basic sciences (organ systems): Chapter 6, pp. 446 - 447.

Nervous System Basic science and clinical condition pp. 60-62.

Lecture (46): Intellectual Functions of the Brain; Physiology of speech (Physiology)

By the end of the lecture the student will be able to:

A.12 Define speech.

A.12 List types of speech (spoken and written).

B.12 Describe mechanism of speech.

B.12 Mention types and mechanisms of speech disorders (aphasia C dysarthria).

NARS: (1.8; 1.10).

References books:

Integrated Neuro Book The nervous system, Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 49; 54-55; 149.

Lecture (47): Cerebellum (functions) (Physiology)

By the end of the lecture the student will be able to:

A.8 List the motor functions of different parts of the cerebellum.

A.8 Identify the functional importance of cerebellum neural circuit.

A.8 Explain the mechanism of action of different parts of cerebellum.

A.8 Describe the relation between cerebellum and stretch reflex (alpha gamma coactivation) and control of equilibrium.

B.8 Summarize role of cerebellum in voluntary movement control.

B.8 Define tremor; **distinguish** its types

B.8 Define nystagmus; **distinguish** its causes, types and mechanism.

NARS: (4.1, 4.2, 4.3).

References books:

The nervous system, Basic Science and Clinical conditions, pp. 175-180.

Lecture (48): Functions of the vestibular apparatus (Physiology)

By the end of the lecture the student will be able to:

A.G Identify the functional components and neural connections of the vestibular apparatus.

A.G Describe the receptors in vestibular system (name, location, adequate stimulation, adaptation).

B.G Explain the effects of stimulation of macula and crista.

B.G Explore the mechanism of detection of angular and linear acceleration.

NARS: (4.1, 4.2, 4.3).

References books:

Integrated Neuro Book The nervous system, Basic sciences and clinical conditions
Adina Michael Titus and Peter Shortland, pp. 152-158.

Lecture (4G): Antipsychotics (Pharmacology)

By the end of the lecture the student will be able to:

B.27.Understand the classification of antipsychotics.

B.27. Explain mechanism of action and the pharmacological actions of antipsychotics.

B.27. Describe the clinical uses and adverse effects of antipsychotics.

NARS: (4.1, 4.2, 4.3).

Ref. books:

FIRST AID for the Basic Science, Organ Systems Third Edition, pp. 535-537.

Basic and clinical pharmacology; B.G. Katzung 10th edition McGraw Hill, pp. 457-473.

Lecture (50): Physiology of basal ganglia (Physiology)

By the end of the lecture the student will be able to:

A.10 Describe direct and indirect circuitry of basal ganglia that control of motor function.

A.10 List neurotransmitters secreted by nuclei of BG.

A. 26 List functions of BG.

B. 10 Explain the changes in muscle tone, involuntary movement, and motor dysfunction associated with lesions of different nuclei of BG.

NARS: (4.1, 4.2, 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 53; 182; 184-197.

Lecture (51): The Limbic system (Physiology)

By the end of the lecture the student will be able to:

A.11. Identify functional components of limbic system mainly hippocampus, amygdala and thalamus.

A.11 Describe functions of hippocampus, amygdala and thalamus.

B.11 Diagram James Papez circuit and its functions.

B.11 Distinguish thalamic syndrome.

NARS: (4.1, 4.2, 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 14-20; 111-112; 253-256.

Lecture (52): Reticular activating system and Wakefulness (Physiology)

By the end of the lecture the student will be able to:

A.11. Describe functions of reticular activating system.

A.11. Describe pathophysiology of coma.

A.11 Describe electroencephalography.

NARS: (4.1, 4.2, 4.3).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland pp. 14-20; 111-112; 253-256.

Lecture (53): Hypnotics and Anxiolytics (Pharmacology)

By the end of the lecture the student will be able to:

A.32 List Hypnotics and Anxiolytics.

A.32 Explain the therapeutic uses and adverse effects of hypnotics/ anxiolytics.

A.32 Explain the pharmacodynamic, pharmacokinetic of hypnotics/ anxiolytics.

NARS: (4.1, 4.2, 4.3).

Ref. books:

FIRST AID for the Basic Science, Organ Systems Third Edition, pp. 528-530.

Basic and clinical pharmacology; B.G. Katzung 10th edition McGraw Hill, pp. 347-360.

Lippincott Illustrated Reviews: Pharmacology, Sixth Edition, pp. 121-133.

Lecture (54): Anti-parkinsonian Drugs (Pharmacology)

By the end of the lecture the student will be able to:

B.27. Explain the therapeutic uses and adverse effects of drugs used in treatment of parkinsonism.

B.27. Understand the mechanism of action and the pharmacological actions of drugs used in treatment of Parkinsonism.

NARS: (4.1, 4.2, 4.3).

Ref. books:

FIRST AID for the Basic Science, Organ Systems Third Edition, pp. 543-545.

Basic and clinical pharmacology; B.G. Katzung 10th edition McGraw Hill, pp. 442-451.

Lippincott Illustrated Reviews: Pharmacology, Sixth Edition, pp. 109-115.

Lecture (55): Tumors of Nervous System (I) (Pathology)

By the end of the lecture the student will be able to:

A.5 Classify intracranial and spinal cord tumors.

B.5 Describe brain metastases.

B.5 Describe WHO grading of brain tumors.

A.5 Know pathology of gliomas.

NARS: (4.1, 4.2, 4.3).

Reference books:

Tao Le et al. (2017) (ppt. 490).

Robbins Basic Pathology 10th edition (2018). (pp.881-886).

Elsevier's integrated pathology (2007) (pp.349-353).

Escourolle C Poirier - Manual of Basic Neuropathology (2004) (21-28/42-45).

Lecture (56): Tumors of Nervous System (II) (Pathology)

By the end of the lecture the student will be able to:

A.5 Know pathology of gliomas and medulloblastoma (definition, sites C age).

A.5 Identify origin, sites, gross and microscopic features of meningioma.

B.5 Compare between schwannoma C neurofibroma.

NARS: (4.1, 4.2, 4.3).

Reference books:

Tao Le et al. (2017) (ppt. 490).

Robbins Basic Pathology 10th edition (2018). (pp.881-886).

Elsevier's integrated pathology (2007) (pp.349-353).

Escourolle C Poirier - Manual of Basic Neuropathology (2004) (21-28/42-45).

Lecture (57): Metabolism of the brain (Biochemistry)

By the end of the lecture the student will be able to:

A.2 Identify substrates used for energy production in the brain.

A.2 Describe briefly how carbohydrate is metabolized in cerebral tissue.

A.2 Describe the significance of oxygen supply to brain energy metabolism.

A.2 Know the amino acid content in cerebral tissue.

A.2 Know the role of lipids in the brain.

B.2 Explain why brain needs energy.

B.2 Explain the effect of hypoxia on the brain metabolism.

NARS: (4.1, 4.2, 4.3).

Reference books:

First aid for USMLE step 1 (2019) p.72-79; 90 - 91.

Lippincott illustrated reviews integrated systems p 444-447.

Textbook of medical biochemistry 8th edition, pp322-430.

Lecture (58): Anticonvulsant (Pharmacology)

By the end of the lecture the student will be able to:

A.8 Classify Anticonvulsants.

A.8 Describe the uses, adverse effect and contraindication of anticonvulsants.

B.8 Explain the mechanism of actions of anticonvulsants.

B.8 Predict drug interaction of antiepileptics.

NARS: (4.1, 4.2, 4.3).

Ref. books:

FIRST AID for the Basic Science, Organ Systems Third Edition, pp. 537-541

Basic and clinical pharmacology; B.G. Katzung 10th edition McGraw Hill, pp.

374-393. Lippincott Illustrated Reviews: Pharmacology, Sixth Edition, pp.

157-167.

Lecture (5G): Development of the nervous system (Anatomy)

By the end of the lecture the student will be able to:

A.14 Enumerate the congenital anomalies of face and neck.

A.14 Define and know the origin and development of the parts of the central nervous system.

B.14 Distinguish between different central nervous system malformations (spina bifida, meningocele, meningomyelocele, myelocele, encephalocele, hydrocephalus, anencephaly).

NARS: (4.1,4.3).

Reference book:

First aid for the basic sciences (organ systems): chapter 6, pp.:412-418.

Lecture (60): Physiology of sleep (Physiology)

By the end of the lecture the student will be able to:

A.13 Define sleep and **know** its importance.

A.13 Identified physiological changes during sleep.

A.13 List and compare different types of sleep.

B.13 Describe distribution of sleep stages (sleep cycles).

B.13 Explain the sleep/wakefulness cycle.

B.13 List the mechanisms (theories) of sleep.

B.13 Describe EEG changes during sleep and wakefulness.

B.13 Explain the different reasons for common sleep disturbances.

NARS: (1.8; 1.10).

References books:

Integrated Neuro Book The nervous system, Basic sciences and clinical conditions

Adina Michael Titus and Peter Shortland pp. 297-301

Lecture (61): Functions of different parts of the eye (Physiology)

By the end of the lecture the student will be able to:

A.14 Describe functions of different components of the eye (cornea, conjunctiva, ciliary body, etc).

A.14 Explain the physiological significance of the papillary reflexes (corneal, light and near).

B.14 Distinguish synthesis, flow and drainage, functions of aqueous humor and, factors affecting intraocular pressure (IOP).

NARS: (4.1; 4.2).

Reference books: Integrated Neuro Book. The nervous system, Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland, pp. 122-140.

Lecture (62): The optical system of the eye (Physiology)

By the end of the lecture the student will be able to:

A.14 Recall basic principles of optics and learn how these principles apply to the eye.

A.14 Know the role of cornea and lens as a refractive medium.

B.14 Explain mechanisms of accommodation.

B.14 Distinguish the types of refractive errors that can occur in the eye and its corrections

NARS: (4.1; 4.2).

Reference books: Integrated Neuro Book. The nervous system, Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland, pp. 122-140.

Lecture (63): The visual process (Physiology)

By the end of the lecture the student will be able to:

A.14 Identify functional organization of the retina.

A.14 Identify functions of different retinal cells.

B.14 Explain scotopic and photopic vision and **Describe** neural basis of visual process.

B.14 Explain the phototransduction process.

NARS: (4.1; 4.2).

Reference books: Integrated Neuro Book. The nervous system, Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland, pp. 122-140.

Lecture (64): Light - Dark adaptation cycle and color vision (Physiology)

By the end of the lecture the student will be able to:

B.14 Describe light -dark adaptation cycle.

B.14 Describe mechanism of colour vision, **Identify** causes and classification of colour blindness.

B.14 Explain mechanism of binocular vision, **Identify** visual acuity and visual field.

NARS: (4.1; 4.2).

Reference books: Integrated Neuro Book. The nervous system, Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland, pp. 122-140.

Lecture (65): Parasitic infections of the eye (Parasitology)

By the end of the lecture the student will be able to:

A.4 List Parasitic diseases which infect the eye.

A.4 Recall and differentiate the infective and diagnostic stages of each parasite.

A.4 Identify mode of infection of each parasite.

B.4 Demonstrate the pathological lesions in the eye caused by each parasite.

B.4 Explain host-parasite relationships (pathogenesis and main clinical presentations of each parasite).

B.4 Describe laboratory diagnosis, imaging and pathological studies of lesions caused by these parasites, and **Recall** treatment and prevention of them.

NARS: (1.8, 2.4, 2.5, 2.6, 4.3).

Reference books:

Lecture notes

First aid for USMLE step 1. Student to student guide 2019. Pages: 158, 159, 177, 180, 182,

Oxford handbook of Medical Sciences 2011. Pages: 825, 830, 834, 819, 863, 924.

Garcia, Lynne Shore, and David A Bruckner. Diagnostic Medical Parasitology. New York: Elsevier, 2016.

Lecture (66): Poliomyelitis, Rabies and Infections of the eye and the ear (Microbiology)

By the end of the lecture the student will be able to:

A.4 Differentiate types of eye and ear infections.

A.4 List causes of various eye and ear infections.

A.4 Differentiate the morphological characteristics and **Identify** the mode of infection of the most common pathogens.

B.4 Demonstrate host parasite relationships (pathogenesis) of each pathogen.

B.4 Explain the main clinical presentations.

B.4 Describe laboratory diagnosis of each case.

NARS: (1.6, 1.8, 2.4, 2.5, 2.6, 4.1, 4.2, 4.3).

Reference books:

YALE-G First Aid: CRUSH USMLE, Step2CK and Step 3 (page 34-37).

Elsevier's Integrated Review Immunology and Microbiology (page 117, 118, 129, 145).

Lecture (67): Histological structure of sensory organs of hearing, balance, taste and smell (Histology)

By the end of the lecture the student will be able to:

A.15 Identify properties of sound as pitch, loudness and temper.

A15 Describe functions of external, middle and inner ear.

A.15 Describe the role of Eustachian tube in health and disease.

B.15 Explain the role of muscles of the middle ear in attenuation reflex.

B.15 Distinguish the role of ossicular system in impedance matching.

B.15 Explain mechanisms of auditory sensory transduction.

B.15 Differentiate between inner and outer hair cells.

NARS: (4.1, 4.2, 4.3).

References books:

Integrated Neuro Book The nervous system, Basic sciences and clinical conditions

Adina Michael Titus and Peter Shortland, pp. 142-151.

Lecture (68): Hearing mechanisms (I) (Physiology)

By the end of the lecture the student will be able to:

A.15 Identify properties of sound as pitch, loudness and temper.

A15 Describe functions of external, middle and inner ear.

A.15 Describe the role of Eustachian tube in health and disease.

B.15 Explain the role of muscles of the middle ear in attenuation reflex.

B.15 Distinguish the role of ossicular system in impedance matching.

B.15 Explain mechanisms of auditory sensory transduction.

B.15 Differentiate between inner and outer hair cells.

NARS: (4.1; 4.2; 4.3).

References books:

Integrated Neuro Book The nervous system, Basic sciences and clinical conditions

Adina Michael Titus and Peter Shortland, pp. 142-151.

Lecture (6G): Hearing mechanisms (II) (Physiology)

By the end of the lecture the student will be able to:

A.15 Identify functions of primary and secondary auditory areas.

B.15 Explain mechanisms of pitch perception.

B.15 Explain mechanisms of sound localization and sound direction identification.

NARS: (4.1, 4.2, 4.3).

References books:

Integrated Neuro Book The nervous system, Basic sciences and clinical

conditions Adina Michael Titus and Peter Shortland, pp. 142-151.

Lecture (70): Chemoreceptor functions (I) (Physiology)

By the end of the lecture the student will be able to:

A.16 List functions of chemical senses.

A.16 Identify chemoreceptors (name, location, adequate stimulus) and Mechanism of stimulation.

A.16 Recognize causes of anosmia.

B.16 Explain mechanisms of olfactory sensory transduction and mechanisms of adaptation.

A.16 Recognize causes of ageusia (gustatory anesthesia).

B.16 Explain mechanisms of gustatory sensory transduction.

B.16 Distinguish the roles of population and frequency coding in representing chemical sensory information.

NARS: (4.1, 4.2, 4.3).

References books:

The nervous system, Basic Science and Clinical conditions, pp. 23, 27, 56, 121-127, 139, 140.

Integrated book pp. 8082.

B. Practical topics and their intended learning outcomes

Students are requested to:

1. Study and prepare the laboratory materials prior to the laboratory session.
2. Prepare a summary of the laboratory procedure.
3. Understand the class materials relevant to the laboratory session.
4. Find out, understand and learn the required skills by the aid of the instructors and faculty will be in the laboratory room to help.
5. Bring their atlas and relevant textbooks or notes to help you in identifying the structures in the anatomy Laboratory.
6. Spend time in the laboratory class to ensure learning the assigned skills.

Laboratory Sessions Instructions:

It is important that students get prepared for their lab sessions by:

7. Studying their reading material.
8. Having a preliminary idea by getting a look at their atlas.
9. Prepare a list of the structures you needed to identify micro and macro.

10. Ongoing to the lab (with atlases and books if wanted) to they develop their skills of comparing, identifying and observing how things fit on each other.
11. Instructors will facilitate the learning process.

Lab (1): Skull (Anatomy)**ILOs: To**

C.5 Identify the normal features of skull (bones forming the cranium, mandible & cervical vertebrae – Identify the sites of fontanel in the fetal skull.

NARS: (4.1).

Lab (2): Skull & cervical vertebrae (Anatomy)**ILOs: To**

C.5 Palpate the surface landmarks of skull, mandible & cervical vertebrae.

C.5 Recognize the articulation of mandible and cervical vertebrae.

NARS: (4.1).

Lab (3): Muscles of the head and neck (Anatomy)**ILOs: To**

C.6 Identify on a specimen the muscles of mastication and the muscles of the face.

C.6 Identify on a specimen the muscles of the neck.

NARS: (4.1).

Lab (4): Blood supply of the head and neck (Anatomy)**ILOs: To**

C.6 Identify the arrangement of carotid and subclavian vessels and their branches in their normal places in cadavers.

NARS: (4.1).

Lab (5): Brain stem, attachments of cranial nerves and spinal cord (Anatomy)**ILOs: To**

C.7 Identify the gross morphology of, brain stem (parts and attachments of cranial nerves) and spinal cord in fresh specimens and models.

NARS: (4.1).

Lab (6): Meninges and brain ventricles (Anatomy)**ILOs: To**

C.7 Recognize the dura, arachnoid and pia matters on flesh specimens.

C.8 Identify the brain ventricles and the relationships of brain ventricles and various parts of the brain and the central canal of the spinal cord, together with choroid plexuses on plastinated sections and brain models.

NARS: (4.1).

Lab (7): Cerebral hemisphere (Anatomy)**ILOs: To**

C.7 Identify the gross morphology of cerebral hemisphere (surfaces, borders, lobes, sulci and gyri) on fresh specimens.

NARS: (4.1).

Lab (8): Slide demonstration and examination of nerve trunk, spinal ganglion and spinal cord (Histology).**ILOs: To**

C.6 Determine the slide of nerve trunk by different stains.

C.6 Identify the slide of spinal ganglion by Hx&E.

C.5 Identify different levels of the spinal cord.

C4. Label a diagram of cervical spinal cord.

NARS: (4.8).

Lab (9): Orbit and ear (Anatomy)**ILOs: To**

C.5 Identify the bones forming the orbit on the skull.

C.5 Identify the contents of the orbit and structure of the eyeball on a model.

C.6 Identify the different parts of the ear.

C.6 Recognize the relations, contents and walls of the middle ear cavity.

NARS: (4.1).

Lab (10): Somatosensory functions (Physiology)**ILOs: To**

C. 9 Perform an examination of different types of sensation.

C. 10 Test fine touch, crude touch, proprioceptive, stereognosis and pain sensation.

NARS: (1.8; 1.10).

Lab (11): Local and general Anesthetics (Pharmacology)**ILOs: To**

C.16 Identify the response of experimental animals to local and general anesthetics.

NARS: (1.8; 1.10).

Lab (12): Drug dependence (Pharmacology)**ILOs: To**

C.17 Identify the manifestation of drug dependence.

C.17 Acquire the appropriate pharmacological approaches for treatment of drug dependence.

NARS: (1.8; 1.10; 1.16).

Lab (13): Transverse and sagittal sections of the brain (Anatomy)**ILOs: To**

C.8 Label the internal structures of the cerebral hemisphere on plastinated sections (transverse and sagittal)

C.8 Identify the arrangement of various parts of diencephalon and basal ganglia in their normal places (in plastinated sections of cerebrum and preserved specimens).

C.8 Interpret anatomical structure with CT scan and carotid angiography.

NARS: (4.1, 4.8).

Lab (14): Spinal reflexes (Physiology)**ILOs: To**

C.10 Test muscle tone for different muscle groups.

C.10 Acquire the skill of examining superficial and deep reflexes.

C.10 Assess muscle power for different muscles of the body.

NARS: (1.8; 1.10).

Lab (15): Coronal sections of the brain (Anatomy)**ILOs: To**

C.8 Label the internal structures of the cerebral hemisphere on plastinated sections (coronal).

C.8 Identify the arrangement of various parts of diencephalon and basal ganglia in their normal places (in plastinated sections of cerebrum and preserved specimens).

C.8 Interpret anatomical structure with CT scan and carotid angiography.

NARS: (4.1, 4.8).

Lab (16): Blood supply of the brain (Anatomy)**ILOs: To**

C.7 Identify the arrangement of vertebrobasilar and carotid vessels with their branches (in preserved specimens) and models of the central nervous system.

NARS: (4.1).

Lab (17): Slide demonstration and examination of Cerebral cortex & Brain stem (midbrain, pons, medulla oblongata) & Cerebellar cortex. (Histology).**ILOs: To**

C.7 Identify the slide of cerebral cortex by Hx & E.

C.7 determines the slide of cerebellum by Hx& E.

C.7 Label diagram of cerebellum.

C.10 Identify and distinguish levels of midbrain, pons and medulla oblongata

NARS: (4.8).

Lab (18): Cerebellum (Anatomy)

ILOs: To

C.7 Identify the gross morphology of cerebellum on fresh specimens.

C.8 Label the internal structures of the cerebellum on both flesh sections plastinated sections.

NARS: (4.1).

Lab (19): Lumbar puncture & Lab Diagnosis of microbial infections of the CNS (Microbiology)

ILOs: To

C.14 Describe the method of specimen collection including the process of lumbar puncture, transportation of specimen, storage and microbiological processing.

C.14 Demonstrate the CSF changes in cases of meningitis.

C.15 Outline the steps of microbiological examination of the CSF to identify the causative pathogen.

NARS: (1.8, 1.11, 2.5, 4.6, 4.8).

Lab (20): Slide demonstration of Schwannoma and Meningioma (Pathology)

ILOs: To

C.13 Examine H&E stained slides and try to reach a provisional diagnosis.

NARS: (1.8, 1.9, 4.8).

Lab (21): Cerebellum and vestibular apparatus examinations (Physiology)

ILOs: To

C.10 Test cerebellar function as Nystagmus, tests of the upper and lower limbs (finger to nose, finger to finger, dysdiadokokinesia, heel to knee test, walking on straight line.....etc.

C.10 Acquire the skill to do tests for vestibular apparatus (Vestibuloocular reflex, Caloric test, mechanical stimulation, thermal stimulation and electrical stimulation, e.g. Barany chair test and caloric test) as well as knowing Romberg test.

NARS: (1.8; 1.10).

Lab (22): Lab diagnosis of microbial infections of the CNS (Microbiology)

ILOs: To

C.14 Demonstrate the CSF findings and microscopic features of meningococcal and cryptococcal meningitis.

C.15 Identify media used, incubation environment, colony morphology and biochemical reactions for meningococcal and cryptococcal meningitis.

C.15 Demonstrate the CSF features and laboratory techniques for diagnosis of causative viral pathogens.

NARS: (1.8, 1.11, 2.5, 4.6, 4.8).

Lab (23): Gross demonstration of specimens of intracranial hemorrhage and examples of brain tumor (Pathology)**ILOs: To**

C.13 Identify the organs grossly.

C.13 Examine size, shape, and any pathological changes and try to reach a provisional diagnosis.

NARS: (1.8, 1.9, 4.8).

Lab (24): Epilepsy, antiparkinsonism and antidepressant (samples, prescriptions) (Pharmacology)**ILOs: To**

C.18 Integrate with drug samples used in different CNS diseases, e.g., epilepsy, parkinsonism, psychosis and depression, etc.

C.18 Acquire the skill to write the prescription for different CNS diseases e.g., epilepsy, parkinsonism, psychosis and depression, etc.

NARS: (1.8; 1.10, 1.16).

Lab (25): Visual system examination (Physiology)**ILOs: To**

C.11 Test corneal reflex (blink reflex).

C.11 Assess pupillary light and near (accommodation) reflexes.

C.11 Monitor visual acuity and **test** the visual field.

C.11 Assess the color vision.

NARS: (1.8; 1.10).

Lab (26): Hearing tests (Physiology)**ILOs: To**

C.12 Acquire the skill of doing hearing tests for differentiating between conductive and sensorineural deafness.

C.12 Assess report on audiometer results.

NARS: (1.8; 1.10).

Lab (27): Slide demonstration and examination of: Eye (Cornea, iris, retina, eye lid & lacrimal gland), Organ of Corti and Taste buds. (Histology).**ILOs: To**

C.11 Microscopic identification of different parts of the eye.

C.11 Microscopic identification of organ of corti.

C.12 Label diagram of organ of corti.

C.9 Label diagram of taste buds.

NARS: (4.8).

Lab (28): Parasitic infection of the Brain and Eye (Parasitology)**ILOs: To**

C.15 Demonstrate microscopic diagnostic features of the causative parasites.

C.15 Identify the infective and diagnostic stages of the parasites under microscope, pathological features in sections of the brain or eye tissues.

NARS: (1.8, 1.11, 2.5, 4.6, 4.8).

C. Topics of Case -based Group Discussion and their intended learning outcomes**Case (1): Fracture of the skull base, Cephalohematoma, Epidural hematoma (Anatomy, 60 min)****ILOs: To**

B.3 correlates anatomical facts concerning the relation of the middle ear to the middle cranial fossa in cases of fracture of the base of the skull and infections of the middle ear.

D.1 Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D.2 Practice the skill of respect colleagues.

D.3 Adhere the value of teamwork by acting in small groups.

NARS: (1.8, 4.5, 5.3).

Reference book:

Kaplan Medical USMLE Step 1 Lecture Notes 2008, Case # 28.

Case Files Anatomy Case # 43, page 288.

Case Files Anatomy Case # 44, page 294.

Case (2): Trigeminal nerve injury (trigeminal neuralgia) (Anatomy, 60 min)**ILOs: To**

B.4 Explain the signs of cranial nerves injury on the basis of anatomical facts

D.1 Practice the skill of respect colleagues.

D.2 Adhere the value of teamwork by acting in small groups.

NARS: (1.8, 4.5, 5.3).

Reference books:

Kaplan Medical USMLE Step 1 Lecture Notes 2008, pp. Case 34 & 38 Anatomy test one.

First Aid Q&A USMLE step Case # 6, pp. 311.

Case files anatomy Case # 41, page 274.

Case (3): Injury of facial nerve (Anatomy, 60 min)**ILOs: To**

B.4 Explain the signs of cranial nerves injury on the basis of anatomical facts

D.1 Practice the skill of respect colleagues.

D.2 Adhere the value of team work by acting in small groups.

NARS: (1.8, 4.5, 5.3).

Reference books:

Kaplan Medical USMLE Step 1 Lecture Notes 2008, Anatomy test 2, Cases 35.

First Aid Q&A USMLE step 1 Case # 15 pp. 313

Case files anatomy Case # 40, pp. 268.

Case (4): Hypoglossal nerve and oculomotor nerve injuries (Anatomy, 60 min)**ILOs: To**

B.4 Explain the signs of cranial nerves injury on the basis of anatomical facts

D.1 Practice the skill of respect colleagues.

D.2 Adhere the value of team work by acting in small groups.

NARS: (1.8, 4.5, 5.3).

Reference books:

Kaplan Medical USMLE Step 1 Lecture Notes 2008, Anatomy test 2, Cases 40

Case files anatomy Case # 42, pp. 280.

Case (5): Brain stem lesion (Anatomy, 60 min)**ILOs: To**

B.4 Explain the signs of cranial nerves injury on the basis of anatomical facts

D.1 Practice the skill of respect colleagues.

D.2 Adhere the value of team work by acting in small groups.

NARS: (1.8, 4.5, 5.3).

Reference books:

The First Aid Cases for the USMLE step 1 case#12 in ch 13

Kaplan anatomy lecture notes case#7,10

Neuroscience pretestcase#30,35,205

Case (6): Schizophrenia (Biochemistry, 60 min)**ILOs: To**

D.2 Present a case of schizophrenia.

D.4 Discuss schizophrenia manifestations and its possible hypotheses.

B.1 Describe major classes of glutamatergic receptors.

B.1 Mention vital processes mediated by glutamatergic neurons.

B.1 Draw glutamate glutamine cycle in the brain.

NARS: (1.8; 1.10; 3.8; 3.9).

Reference book: The nervous system, basic science and clinical condition, second edition (case # 15.1,15.2, pp 268, 268-275).

Case (7): Depression (Biochemistry, 60 min)**ILOs: to**

D.1 Discussion of a case of depression.

D.1 Define depression and its clinical characteristics.

D.1 Relation between brain neurotransmitters and depression.

D.1 Explain processes that might lower brain neurotransmitter levels.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

The nervous system, basic science and clinical conditions, second edition (case □ 16.1 ,pp. 282 , 281 – 287) .

Case (8): Branchial arches development (Cleft lip) -Torticollis (Anatomy, 60 min)**ILOs: To**

B.3 Interpret some clinical findings in relation to developmental basis.

D.1 Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

NARS: (1.8, 4.5).

Reference books:

Kaplan Medical USMLE Step 1 Lecture Notes 2008, pp. Anatomy test Two, Case 39.

Case files anatomy Case # 38, pp. 256.

Case (9): Meningitis, Cerebral abscess & Hydrocephalus (Pathology, 60 min)**ILOs: To**

B.1 Analyze and interpret the available data to achieve the diagnosis of different types of meningitis.

D.1 Differentiate between viral & suppurative meningitis.

D.2 Evaluate the consequences of meningitis.

D.1 Use history, clinical, laboratory & radiological data to diagnose brain abscess & differentiate it from other causes of SOL.

B.1 Explore tuberculous CNS lesions.

D.2 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.3 Organize time and resources effectively and set priorities.

NARS: (4.3, 4.5, 4.6). (1.9, 1.10, 4.8, 5.3) (1.9, 1.10, 4.8, 5.3).

Reference books:

First AID Cases for the USMLE Step1 3rd edition (Case #40, pp.307).

Robbins & Cotran Review of Pathology 4th edition (Cases # 36, pp.437-438).

Case (10): Lesions of different motor and sensory areas of the cerebral cortex (Physiology, 60 min)**ILOs: To**

B.7 Explore effect of lesion of different somatosensory and motor areas to diagnose and locate site of damage of neurological cases.

D.5 Use information by all means, including electronically differentiating between lesions of different motor and sensory areas of the cerebral cortex.

D.5 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.5 Organize time and resources effectively and set priorities.

NARS: (1.8; 1.10).

References books:

Case files Neuroscience (Case # 24 and # 47, pp. 191 and 363).

Case (11): Depression (Pharmacology, 60 min)**ILOs: To**

D.2 Present a case of depression with its clinical manifestation.

D.2 Discuss the pharmacological basis of the drugs used in the treatment of depression.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

The First Aid Cases for the USMLE, 3rd Edition, Case # 4, pp. 315.

Lippincott Illustrated Reviews: Pharmacology, Sixth Edition, pp. 144-145.

Case (12.1): Headache (Physiology, 30 min)**ILOs: To**

B.1 Explore mechanism of headache.

D.1 Use information by all means, including electronically differentiating between types and different causes of headache.

D.1 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.1. Organize time and resources effectively and set priorities.

D.1 Discuss their work and that of others, using constructive feedback.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

Case files Neuroscience (Case # 30, pp. 241).

Case (12.2): Migraine (Pharmacology, 30 min)**ILOs: To**

D.2 Present a case of migraine.

D.4 Discuss the pharmacological basis of the drugs used in the treatment of migraine.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

Lippincott Illustrated Reviews: Pharmacology, Sixth Edition, pp. 466-468, CASE number 12-1.

Case (13): Cases of upper and lower motor neuron lesions (Physiology, 30 min)**ILOs: To**

C.10 Apply knowledge in diagnosis and location of lesions in motor pathways to differentiate between upper motor neuron lesion and lower motor neuron lesion.

C.10 Use information related to muscle tone to distinguish flaccidity, rigidity and spasticity; tendon jerk and muscle status.

D.3 Use information by all means, including electronically differentiating between upper motor neuron lesion and lower motor neuron lesion.

D.3 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively to distinguish flaccidity, rigidity and spasticity: tendon jerk and muscle status.

D.3 Organize time and resources effectively and set priorities.

D.3 Discuss their work and that of others, using constructive feedback.

NARS: (1.8; 1.10).

References books:

Case files Neuroscience (Case #2 and #6, pp. 15 and 49).

Case (14): A case of chronic pain (Physiology, 60 min)**ILOs: To**

D.4 Use information by all means, including electronically to apply theories of pain control (gate control theory and descending control of pain) in management of chronic intractable pain conditions (arthritis and malignancy).

D.4 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.4 Organize time and resources effectively and set priorities.

D.4 Discuss their work and that of others, using constructive feedback.

NARS: (1.8; 1.10).

References books:

Integrated Neuro Book Basic sciences and clinical conditions Adina Michael Titus and Peter Shortland; Case # Box 5.1; pp 80.

Case (15): Transection of the spinal cord (Physiology, 60 min)

ILOs: To

D.6 Use information by all means, including electronically differentiating between complete, hemi section, anterior and posterior quadrant lesions of the spinal cord.

D.6 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.6 Organize time and resources effectively and set priorities.

D.6 Discuss their work and that of others, using constructive feedback.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

Case files Physiology (Case # 46, pp. 371); Case Files: Neuroscience (Case # 19, pp. 147).

Case (16): Cerebral arteries – Stroke (Anatomy, 60 min)

ILOs: To

B.3 Interpret anatomical facts with its major clinical applications (vascular injuries of internal capsule).

D.1 Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D.2 Adhere the value of teamwork by acting in small groups.

NARS: (1.8, 4.5, 5.3).

Reference books:

First Aid Q&A USMLE step 1 Case # 10, pp. 312; Case # 21, pp. 314.

Case files neuroscience case# 44

Case (17): Drug dependence (Pharmacology, 60 min)

ILOs: To

D.2 Present a case of drug dependence.

D.4 Discuss the manifestation and treatment of drug dependence.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

References books:

The First Aid Cases for the USMLE, 3rd Edition, Case #8, pp. 9.

Case (18): Stroke (Pathology, 60 min)

ILOs: To

B.1 Use information by all means (history, clinical & radiological data) to diagnose a case of stroke & identify its causes.

B.2 Analyze pathology of brain infarction in correlation to radiologic data.

B.3 Differentiate between epidural & subdural hemorrhage.

B.4 Explore types & complications of cerebral aneurysms.

D.1 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.2 Organize time and resources effectively and set priorities.

D.3 Discuss their work and that of others, using constructive feedback.

NARS: (1.9, 1.10, 4.8).

Reference books:

Case File pathology, 2nd edition (Case # 12, pp. 109).

First AID Cases for the USMLE Step1 3rd edition (Case #29, pp.296).

First AID Cases for the USMLE Step1 3rd edition (Case #32, pp.299).

Case (19): Parasitic infections cause space occupying lesions of the Brain/ Parasitic infections of the Eye (Parasitology, 60 min)

ILOs: To

B.28 Identify the main parasites causing space occupying lesions of the brain/ infections of the eye.

B.28 Analyze and interpret history, clinical, laboratory and radiological data to achieve the diagnosis of these parasitic infections.

B.28 Explain the mode of transmission, parasitological course and complications of the parasites.

B.28 Recall treatment and prevention

D.1 Practice the skill of self-learning.

D.2 Practice the value of teamwork by acting in small groups.

D.3 Develop adequate cooperation with his colleagues.

D.4 Arrange the efforts required to accomplish the tasks in specified time.

D.5 Reflect on and assess his/her performance using various performance indicators and information sources.

D.6 Modify his capability to describe, discuss and solve problems.

NARS: (1.8, 2.5, 2.9, 4.5, 4.6, 4.7, 4.8, 1.11).

Reference books:

Cases in Human Parasitology Judith S. Heelan Washington, DC press, 2004. Case #13, pp.55, Case # 14, pp. 59, Case #17, pp.71, Case# 18, pp. 75, Case#21, pp.87, Case #29, pp. 109.

Case (20): Parasitic infections cause Brain diseases (Encephalitis, Meningoencephalitis, Cerebrovascular diseases) (Parasitology, 60 min)

ILOs: To

B.28 Identify the main parasites causing Encephalitis, Meningoencephalitis, Cerebrovascular diseases.

B.28 Analyze and interpret history, clinical, laboratory and radiological data to achieve the diagnosis of these parasitic infections.

B.28 Explain the mode of transmission, parasitological course and complications of the parasites.

B.28 Recall treatment and prevention

D.1 Practice the skill of self-learning.

D.2 Practice the value of teamwork by acting in small groups.

D.3 Develop adequate cooperation with his colleagues.

D.4 Arrange the efforts required to accomplish the tasks in specified time.

D.5 Reflect on and assess his/her performance using various performance indicators and information sources.

D.6 Modify his capability to describe, discuss and solve problems.

NARS : (1.8, 2.5, 2.9, 4.5, 4.6, 4.7, 4.8, 1.11)

Reference books:

Cases in Human Parasitology Judith S. Heelan Washington, DC press, 2004. Case #13, pp55, Case # 14, pp. 59, Case #17, pp.71, Case# 18, pp. 75, Case#21, pp.87, Case #29, pp. 109.

Case (21): Syringomyelia (Anatomy, 60 min)

ILOs: To

D.1 Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D.2 Practice the skill of respect colleagues.

D.3 Adhere the value of teamwork by acting in small groups.

NARS: (1.8, 4.5, 5.3).

Reference book:

First Aid Q&A USMLE step 1 Case # 23; pp. 314.

Case (22.1): Aphasia and dysarthria (Physiology, 30 min)

ILOs: To

B.21 Differentiate between various types of aphasia.

D.11 Use information by all means, including electronically, differentiating between different types of aphasia and dysarthria.

D.11 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.11 Organize time and resources effectively and set priorities.

D.11 Discuss their work and that of others, using constructive feedback.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

Case Files: Neuroscience (Case # 44, pp. 343).

Case (22.2): Thalamic syndrome (Physiology, 30 min)

ILOs: To

B.6 Explore different symptoms and signs of thalamic syndrome.

D.2 Use information by all means, including electronically differentiating between lesions of different nuclei of the thalamus and identifies symptoms and signs of thalamic syndrome.

D.2 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.2 Organize time and resources effectively and set priorities.

D.2 Discuss their work and that of others, using constructive feedback.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

References books:

Case files Neuroscience Case # 18; pp. 22.29.

Case (23.1): Ataxia (Physiology, 30 min)**ILOs: To**

D.8 Use information by all means, including electronically, to evaluate the consequences of lesions of different parts of the cerebellum.

D.8 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively to to differentiate between sensory and motor ataxia.

D8 Organize time and resources effectively and set priorities.

D.8 Discuss their work and that of others, using constructive feedback.

NARS: (1.8; 1.10).

Reference book:

Case files Physiology (Case # 48, pp. 387).

Case (23.2): Vertigo (Physiology, 30 min)**ILOs: To**

D.9 Use information by all means, including electronically, differentiating between causes vertigo (labyrinth, cerebellum, brain stem).

D.9 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.9 Organize time and resources effectively and set priorities.

D.9 Discuss their work and that of others, using constructive feedback.

NARS: (3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

Case files Physiology (Case # 44, pp. 357).

Case (24): Parkinsonism, athetosis, hemiballismus, chorea (Physiology, 60 min)**ILOs: To**

D.10 Use information by all means, including electronically differentiating between basal ganglia disorders (manifestation, causes, management).

D.10 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.10 Organize time and resources effectively and set priorities.

D.10 Discuss their work and that of others, using constructive feedback.

NARS: (3.1; 5.2; 5.3; 5.4; 5.6; 5.7)

Reference book:

Case Files: Neuroscience (Case # 7 and # 15, pp. 57 and 115).

Case (25): Tetanus, botulism, Rabies, Poliomyelitis and prion diseases (Microbiology, 60 min)**ILOs: To**

D.1 Use of information by all means, including electronics.

D.6 Analyze and interpret the available data to achieve the diagnosis

D.5 Practice the value of teamwork by acting in small groups.

D.9 Arrange the efforts required to accomplish the tasks in specified time.

D.10 Reflect on and assess his/her performance using various performance indicators and information sources.

NARS: (1.8, 2.5, 2.9, 4.5, 4.6, 4.7, 4.8, 1.11)

Reference books:

Pretest Microbiology: (Case # 40 pp.44, Case # 214 pp.188).

First Aid Q&A: (Case # 14 pp.67, Case # 24 pp.69).

Case (26): Alzheimer & Parkinsonism & Multiple Sclerosis (MS) (Pathology, 60 min)

ILOs: To

B.1 Discuss the key difference between neurologic degenerative diseases.

B.2 Analyze pathology & microscopic finding of Alzheimer disease.

B.3 Assess definition & causes of dementia.

D.1 Practice the skill of self-learning..

B.1 Analyse & interpret the available data to achieve the diagnosis of MS.

D.1 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

NARS: (4.3, 4.5, 4.6).

Reference books:

Case File pathology, 2nd edition (Case # 13 ppt. 117).

First AID Cases for the USMLE Step1 3rd edition (Case #26, pp.296 & Case #23, pp.288).

Case (27): Neural tube defect-cerebellum development (Anatomy, 60 min)

ILOs: To

D.1 Deduce how and why common malformations occur in the nervous system.

D.2 Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D.3 Practice the skill of respect colleagues.

D.4 Adhere the value of teamwork by acting in small groups.

NARS: (1.8, 4.5).

Reference book:

First Aid Q&A USMLE step 1 Case # 30, pp. 316.

Kaplan Medical USMLE Step 1 Lecture Notes 2008, Case # 27 Anatomy test one.

Kaplan Medical USMLE Step 1 Lecture Notes 2008, Case # 11. Anatomy test one

Case (28.1): Epilepsy (Pharmacology, 30 min)

ILOs: To

D.4 Present cases of epilepsy.

D.4 Discuss the pharmacological basis of different drugs used in the treatment of epilepsy.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

The First Aid Cases for the USMLE, 3rd Edition, Case # 28, pp. 295.

Lippincott Illustrated Reviews: Pharmacology, Sixth Edition; pp. 169-170.

Case (28.2): Alzheimer disease (Pharmacology, 30 min)

ILOs: To

D.5 Present a case of Alzheimer.

D.5 Discuss the pharmacological basis of drugs used in the treatment of Alzheimer disease.

NARS: (3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

The First Aid Cases for the USMLE, 3rd Edition, Case # 1, pp. 266.

Lippincott Illustrated Reviews: Pharmacology, Sixth Edition; pp. 118-119.

Case (29): Tumors of nervous system (Pathology, 60 min)**ILOs. To**

B.1 Analyze how to differentiate between various brain tumors according to site & age.

B.2 Explore most common CNS tumors in children & adult.

B.3 Compare & contrast the location of CNS tumors in children & adult.

B.4 Analyze the available data to achieve the diagnosis of metastatic tumors.

D.1 Discuss their work and that of others, using constructive feedback.

D.2 Practice the skill of self-learning.

NARS: (4.3, 4.5, 4.6).

Reference books.

First AID Cases for the USMLE Step1 3rd edition (Case #20 pp.285).

Case File pathology, 2nd edition (Case # 14, pp. 127).

First AID Cases for the USMLE Step1 3rd edition (Case #10 pp.275).

Case (30): Tumors of nervous system (Pathology, 60 min)**ILOs. To**

B.1 Analyze history, clinical & radiological data to Diagnose brain & spinal cord tumors.

D.1 Organize time and resources effectively and set priorities.

D.2 Discuss their work and that of others, using constructive feedback.

B.3 Compare between Schwannoma & Neurofibroma.

B.4 Explore neurofibromatosis type 1 & 2.

D.3 Present information clearly in written, electronic and oral forms, & communicates ideas and arguments effectively.

NARS. (1.9, 1.10, 4.3, 4.5, 4.6, 4.8)

Reference books:

First AID Cases for the USMLE Step1 3rd edition (Case #17 &18 pp.282&283).

Case File pathology, 2nd edition (Case #15 pp. 133).

Case (31.1): Errors of refraction and night blindness (Physiology, 30 min)**ILOs: To**

D.12 Use information by all means, including electronically to **distinguish** the different types of refractive errors that can occur in the eye and to **apply** optical principles for correction of errors of refraction.

D.12 Present information clearly in written, electronic and oral forms to know importance of vit A in dim vision and to **diagnose** a case of night blindness.

D.12 Organize time and resources effectively and set priorities.

D.12 Discuss their work and that of others, using constructive feedback.

NARS: (1.8; 1.10).

Reference book:

Case files Physiology (Case # 43, pp. 349).

Case (34): Deafness (Physiology, 60 min)**ILOs: To**

D.14 Use information by all means, including electronically differentiating between conductive and perceptive deafness.

D.14 Present information clearly in written, electronic and oral forms, and communicates ideas and arguments effectively.

D.14 Organize time and resources effectively and set priorities.

D.14 Discuss their work and that of others, using constructive feedback.

NARS: (1.9; 3.1; 5.2; 5.3; 5.4; 5.6; 5.7).

Reference book:

Case files: Neuroscience (Case # 22, pp. 171).

Case (35): Corneal abrasion, clinical cases about abnormalities in neurons, glial cells and synapses (Histology, 60 min)**ILOs: To**

D.1 Explain the signs of these diseases on the basis of histological facts.

D.2 Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D.3 Practice the skill of respect colleagues.

D.4 Adhere the value of teamwork by acting in small groups.

NARS: (1.8, 4.5).

Reference book:

Case files Neuroscience (cases 1.2, 1.3, 2.1, 2.3, 5.1 & 5.3. pp. 11, 12, 20, 21, 46 & 47), FIRST AID CASES for the USMLE STEP 1, Case # 4, pp. 269.