UNIVERSITI SULTAN ZAINAL ABIDIN

Faculty of Medicine

Students Guide: Semester 1h Year 2

Academic Session: 2020/2021

Name of Course: Organ System III

Course Code: BMM20116

Module 9: Nervous System

(ONLINE TEACHING)

Date of Module: 18th Oct – 25th Nov 2020

Prepared by:

…… Date:
(signature)

MRS. NORHAZILAH MUHAMAD
Module Coordinator (Nervous System)
Pre-clinical MBBS Programme
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DR. NOR IZA BINTI A. RAHMAN
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Endorsed by:

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MBBS curriculum Committee Members
Medical Faculty, UniSZA

FACULTY OF MEDICINE

VISION

Faculty of Medicine aspires to be an excellent institution in producing high quality health professionals, research and community services.

MISSION

Faculty of Medicine shall provide dynamic curricula guided by excellent educators in conducive environment, nurture sustainable research culture and inculcate community-focused activities.

TEACHING AND LEARNING METHODS

L : Lecture
CAL : Computer Assisted Learning
PRC : Practical
ECE : Early Clinical Exposure
PPD : Personal and Professional Development
PBL : Problem Based Learning
TUT : Tutorial

ASSESSMENT:

Continuous Assessment (CONASS)
End of Module Assessment (EOM)
End of Semester Examination (EOS)

LOCATION

MKK 1 : Makmal Kemahiran Klinikal 1
MKK 2 : Makmal Kemahiran Klinikal 2
DK A : Dewan Kuliah A
DK B : Dewan Kuliah B
DK C : Dewan Kuliah C
CL 1 : Makmal Komputer 1
CL 3 : Makmal Komputer 3
M. Biokim : Makmal Biokimia
M. Mikro : Makmal Mikrobiologi
M. Histo : Makmal Histologi
BT1 : Bilik Tutorial 1
BT2 : Bilik Tutorial 2
BT3 : Bilik Tutorial 3
BT4 : Bilik Tutorial 4
BT5 : Bilik Tutorial 5
BT6 : Bilik Tutorial 6
BT7 : Bilik Tutorial 7
BT8 : Bilik Tutorial 8
BT9 : Bilik Tutorial 9
BT10 : Bilik Tutorial 10
BT11 : Bilik Tutorial 11
BT12 : Bilik Tutorial 12
BT13 : Bilik Tutorial 13

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MODULE 9: NERVOUS SYSTEM

Module coordinator: Mrs. Norhazilah Muhamad **Ext: 5546/ Hp: 012-9536877**

CONTENT SYNOPSIS

This module provide the student the fundamental knowledge in an integrated approaches of learning the nervous system (NS). It covers neuroanatomy, radioanatomy, histology, embryology, physiology and biochemistry of the nervous system. The pathology of diseases in the nervous system and their clinical manifestations, as well as related microbiology and psychomedical problems, history taking and clinical examination, and pharmacological treatment make up the whole integrated module.

In each lecture, the scope of learning is outlined in the guidebook. Students are expected to further acquire their knowledge through reading of the suggested textbooks and recommended websites.

OBJECTIVES/ INTENDED LEARNING OUTCOMES

By the end of this module, the students should be able to:

1. Describe the gross and radiological anatomy, histology, embryology, physiological mechanisms and biochemical processes in the nervous system, histopathology, pathophysiology, microbiology and clinical aspects, psychomedicine and pharmacology of drugs used in the treatment of common diseases in the NS.
2. Apply basic sciences knowledge to the clinical problems in the NS.
3. Demonstrate the ability to identify gross, histological and radiological anatomy structures, pathological changes in common diseases in the NS, interpret biochemical, serological and microbiological results, and perform basic clinical skills in the NS.
4. Demonstrate communication skills, teamwork, attitude and lifelong learning.

LEARNING ACTIVITIES

1. Lectures
2. Tutorials
3. Practical
4. Forum/panel discussion
5. Problem based learning (PBL)
6. Self-Study
7. Seminars
8. Computer Assisted Learning (CAL)

ASSESSMENT METHODS

1. Continuous Assessment - Assignments, CAL, Seminar, PBL
2. End of Module Assessment (EOM) - MCQ, SEQ
3. End of Semester Examination (EOS) - MCQ, SEQ, PBQ, OSPE
4. Professional 1 Examination (PRO 1) - MCQ, SEQ, PBQ, OSPE

OUTLINE OF COURSE CONTENT (LECTURES)

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
An Introduction to Module	**Mrs. Norhazilah Muhamad**	**Introduction to module and revisit to the Nervous tissue**	• Describe the histological features of the neuron • Classify neurons. • Explain the histological features of the neuroglia
Anatomy 1	**NM**	**Spinal cord**	• Describe the external features of the spinal cord • Describe the distribution of gray and white matter in the spinal cord • Describe the formation and distribution (dermatomes) of a spinal nerve. • Describe in brief the formation of nerve plexuses. • Describe the blood supply to the spinal cord. • Discuss the clinical application.
Anatomy 2	**AH** **1 ½ Hrs lecture**	**Brainstem**	• Describe the major components and external features of the brainstem. • Describe the gross anatomy of midbrain, pons and medulla oblongata. • Explain the cross sectional appearance at different levels of brain stem. • Discuss the clinical application.

Anatomy 3	**TFM**	**Cerebrum**	• Describe general anatomical features of cerebral hemisphere: surfaces, poles, lobes, sulci and gyri
			• Explain the functional areas of cerebral hemisphere.
			• Describe the white matter of cerebrum- association, commissural, projection fibres.
			• Describe the internal capsule under the following headings:
			  ○ Parts.
			  ○ Fibres passing through the different parts.
			  ○ Blood supply.
			• Discuss the clinical application.

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
Anatomy 4	**TFM**	**Blood supply of the nervous system**	• Describe the origin, branches, and areas supplied by the internal carotid artery. • Describe the origin, branches, and areas supplied by the vertebral artery. • Describe the location, formation and branches of Circle of Willis. • Describe the venous drainage of the central nervous system. • Discuss the clinical application.
Anatomy 5	**AH**	**Meninges & Dural venous sinuses**	• Describe the meninges: dura, arachnoid and pia mater. • Classify and describe the dural venous sinuses. Discuss the clinical application.
Anatomy 6	**NFCL**	**Ventricles of brain & cerebrospinal fluid circulation**	• Name the ventricles of brain. • Describe the structure and anatomical relations of each ventricle • Explain the production, circulation, absorption, composition and function of cerebrospinal fluid. • Discuss the clinical application
Anatomy 7	**NM**	**Thalamus and hypothalamus**	• Describe the diencephalon and name its components. • List the nuclei of thalamus. • State the functions of important nuclei of thalamus.
Anatomy 8	**NM**	**Basal nuclei and cerebellum**	• List the basal nuclei and their connections. • Describe the gross anatomical features of the cerebellum. • List the deep nuclei of cerebellum. • State the connections of cerebellum. • Discuss the clinical application.
Anatomy 9	**AH**	**Ascending and descending tracts**	• Describe the ascending and descending tracts of the brain and spinal cord. • Discuss the clinical application.

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
Anatomy 10	**AH**	**Autonomic nervous system**	• Name the components of the autonomic nervous system. • List the components of the sympathetic nervous system. • Describe the sympathetic trunk and ganglia. • List the components of the parasympathetic nervous system. • Describe in brief the parasympathetic ganglia. • Discuss the clinical application.

Anatomy 11	**NM**	**Cranial nerves I (CN 1,2,3,4,6)**	• Describe the twelve pairs of cranial nerves under the following headings:
			  ○ Nuclei
			  ○ Functional components
			  ○ Course
			  ○ Distribution
			• Describe the olfactory, visual and auditory pathways.
			• Discuss the clinical application.
			• Describe the clinical features of Trigeminal neuralgia and Bell palsy

Anatomy 12	**AH**	**Cranial nerves II (CN 5,7, 8)**	
Anatomy 13	**TFM**	**Cranial nerves III (CN 9,10,11, 12)**	
Anatomy 14	**NFCL**	**Ear**	• Describe the anatomy of inner, middle and outer ears. • Discuss the clinical application.
Anatomy 15	**NFCL**	**Orbit & Eye**	• Describe the boundaries and contents of bony orbit. • Describe the eyeball and extra ocular muscles. • Describe the anatomy of lacrimal apparatus. • Discuss the clinical application.
Anatomy 16	**NFCL**	**Histology of the CNS**	• Describe the microscopic features of the cerebrum, cerebellum and at different levels of the spinal cord.
Anatomy 17	**TFM**	**Development of the nervous system**	• Describe early stages of development of central nervous system (neural tube). • Describe the development of brain and spinal cord.

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
			• Explain the arrangement of cranial nerve nuclei in the brain stem. • Discuss the congenital anomalies of the brain and spinal cord.
Physiology 1	**NAS**	**The physiology of somatic sensations**	• Describe the classifications of somatic sensation. • Describe the characteristics and explain the mechanisms of transduction of somatic sensory receptors. • Describe the role of the sensory cortex. • Describe the consequences of abnormalities in somatic sensibilities.
Physiology 2	**NAS**	**Nociception**	• Describe the nociceptive system. • Explain the analgesic systems and the mechanism of referred pain. • Describe the consequences of abnormalities in nociception.
Physiology 3	**NAS**	**Muscle tone, posture, locomotion and the motor cortex**	• Describe the relationship between muscle tone, posture, locomotion and the motor cortex. • Explain the mechanism for voluntary and skilled movements. • Describe the consequences of motor abnormalities - hypotonia, hypertonia, rigidity, paralysis.
Physiology 4	**MMT**	**Basal ganglia and cerebellum**	• Describe the functions of basal ganglia. • Explain the role of neurotransmitters in basal ganglia disorders. • Describe the functions of cerebellum • Explain the consequences of abnormalities of cerebellar functions.
Physiology 5	**MMT**	**Hypothalamus and eating behaviour**	• Describe functional structures of the hypothalamus • Explain the role of hypothalamus in the regulation of eating behavior. • Describe the consequence of abnormalities of eating behavior.
Physiology 6	**NAS**	**Thermo-regulation**	• Describe functional structures associated with thermoregulation. • Explain the physiological mechanism of thermoregulation • Describe the consequences of abnormalities in thermoregulation

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
Physiology 7	**MNMN**	**Wakefulness, sleep and EEG**	• Describe the functional structures of the reticular formation. • Explain the role of the reticular formation in arousal and sleep. • Describe the uses of the EEG and the consequences of sleeping disorders.
Physiology 8	**MMT**	**Limbic system, learning and memory**	• Describe functional structures associated with the limbic system. • Explain the role the system in expression of emotion, memory and learning. • Describe the physiological basis of learning and memory. • Describe implications of memory and learning abnormalities.
Physiology 9	**NAAB**	**Hearing**	• Describe the functional structures of hearing. • Explain the physiology of hearing. • Describe the consequences of hearing abnormalities.
Physiology 10	**NAAB**	**Vestibular apparatus and equilibrium**	• Describe the functional structure of the vestibular apparatus. • Explain the mechanism and role of the semicircular canals in maintaining equilibrium. • Describe the consequences of abnormalities in equilibrium.
Physiology 11	**MNMN**	**Vision**	• Describe the functional structures associated with vision. • Explain the physiological mechanism of vision. • Describe the consequences of abnormalities in vision.
Physiology 12	**MNMN**	**Taste and smell**	• Describe the functional structures associated with gustation and olfaction. • Explain the physiological mechanisms of gustation and olfaction. • Describe the consequences of abnormalities of gustation and olfaction.

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME

Biochemistry 1 & 2	**HAN**	**Neurotransmitter 1 & 2**
		(2 hrs)
			• Define and explain what is a neurotransmitter
			• Classify neurotransmitters.
			• Outline the sequence of steps in the action of a neurotransmitter.
			• Briefly explain metabolism of
			  ○ catecholamines (dopamine, norepinephrine and epinephrine).
			  ○ serotonin.
			  ○ histamine,
			  ○ acetylcholine,
			  ○ glutamate and γ-aminobutyric acid (GABA).
			• Briefly describe metabolic encephalopathies and neuropathies (Hepatic encephalopathy and Diabetic neuropathy)

Biochemistry 3	**USMR**	**Vitamin A metabolism**	• Describe the chemistry, absorption and storage of vitamin A. • Describe the role of vitamin A in vision and other roles • List the deficiency diseases, daily requirements and dietary sources of vitamin A
Pathology 1	**GS**	**Brain and spinal cord tumours**	• Explain the causes, pathology and pathogenesis of common primary and secondary neoplasms of the brain and spinal cord. • Describe the gross and microscopic features of the brain and spinal cord tumours. • Outline the histological types and grading of tumours. • Outline the complications (including space-occupying lesions [SOL]) and spread of malignancies. • Describe other causes of SOL.
Pathology 2	**NHAB**	**Cerebrovascular diseases**	• Differentiate between traumatic and non-traumatic causes of cerebrovascular diseases (CVD) • List and explain the causes of traumatic and non-traumatic causes of CVD • Explain the pathogenesis, pathology and complications of different

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
			types of CVD.
Microbiology 1	**NIAR**	**Bacterial Meningitis**	• Define bacterial meningitis. • Define the epidemiology and risk factors • List the causative organisms. • Explain the pathogenesis, pathophysiology, clinical presentations and complications of meningitis. • Describe the microbiological investigation. • Outline the management.
Microbiology 2	**NIAR**	**Tuberculosis, cryptococcal and viral meningitis**	• Define tuberculosis, cryptococcal and viral meningitis. • Describe the epidemiology and risk factors. • List the causative organisms. • Explain the pathogenesis, pathophysiology, clinical presentations and complications. • Describe the microbiological investigation. • Outline the management.
Microbiology 3	**SIS**	**Encephalitis**	• Define encephalitis • Describe the epidemiology and risk factors. • List the causative organisms. • Explain the pathogenesis, pathophysiology, clinical presentations and complications. • Describe the microbiological investigation. • Outline the management.
Microbiology 4	**SIS**	**Brain abscess**	• Define brain abscess • Describe the epidemiology and risk factors. • List the causative organisms. • Explain the pathogenesis, pathophysiology, clinical presentations and complications. • Describe the microbiological investigation. • Outline the management.

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
Pharmacology 1	**SYNJ**	**Cholinergic Drugs**	• Classify the agonists and antagonists of cholinergic nervous system • Discuss the effects of the agents listed above • Describe the uses of cholinergic and anti-muscarinic agents.
Pharmacology 2	**MSAA**	**Adrenergic Drugs**	• Classify the agonists and antagonists of sympathetic nervous system • Discuss the effects of the agents listed above • Describe the uses of sympathomimetics and sympatholytics.
Pharmacology 3	**MSAA**	**Hypnotics and Anxiolytics**	• Classify hypnotics and anxiolytics. • Explain the mechanism of action of hypnotics and anxiolytics. • Describe pharmacokinetics, uses and side effects of hypnotics and anxiolytics.
Pharmacology 4	**MSAA**	**Antidepressants and Mood stabilisers**	• Classify antidepressants and mood stabilisers. • Explain the mechanism of action of antidepressants and mood stabilisers. • Describe pharmacokinetics, uses and side effects of antidepressants and mood stabilisers.
Pharmacology 5	**SDA**	**Antipsychotics**	• Classify antipsychotics. • Explain the mechanism of action of antipsychotics. • Describe pharmacokinetics, uses and side effects of antipsychotics.
Pharmacology 6	**SDA**	**Opioid Analgesics**	• Classify opioid analgesics. • Explain the mechanism of action of opioid analgesics. • Describe pharmacokinetics, uses and side effects of opioid analgesics.

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
Pharmacology 7	**MSAA**	**Anti-Parkinson and Anti-Alzheimer agents**	• Classify anti-Parkinson and anti-Alzheimer agents. • Explain the mechanism of action of anti-Parkinson and anti-Alzheimer agents. • Describe pharmacokinetics, uses and side effects of anti-Parkinson and anti-Alzheimer agents.
Pharmacology 8	**SDA**	**General Anaesthetics**	• Describe the pharmacology of drugs used for premedication, induction of GA and gaseous anaesthetics.
Pharmacology 9	**SDA**	**Anti-epileptic agents**	• Classify anti-epileptic agents. • Explain the mechanism of action of anti-epileptic agents. • Describe pharmacokinetics, uses and side effects of anti-epileptic agents.
Pharmacology 10	**MSAA**	**Drug abuse and Psychostimulants**	• Describe drug abuse, tolerance, physical and psychological dependence, as well as withdrawal symptoms. • Describe the receptor and neurotransmitter mechanisms of stimulation for the above concepts. • List commonly abused psychostimulants eg. amphetamines and related compounds; cocaine, nicotine, etc.
e learning (KeLIP)	**MSAA**	**Local Anaesthetics**	• List local anaesthetics and the various methods used in local anaesthesia. • Explain the mechanism of action of local anaesthetics. • Describe the uses and side effects of local anaesthetics.
Psychological Medicine 1	**Prof Dr. Vidya**	**Learning theory & its application**	• Describe Classical & Operant conditioning • Describe Bandura Social learning theory • Describe Modelling • Explain the application of learning theory in Medicine.

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
Psychological Medicine 2	**Dr. Khairi**	**Psychosis**	• Define psychosis • List organs and systems related to psychosis • Name the neurotransmitters involved in the etiology of psychosis and briefly explain their metabolism • Appreciate medical conditions manifesting with psychotic symptoms • Describe the implications and management of psychotic disorders
Psychological Medicine 3	**AP. Dr. Rohayah**	**Mood disorders**	• Define emotion, mood and mood disorders • Explain the etiology of mood disorders from biological perspectives. • Correlate the neuropathology and its related symptomatology of mood disorders. • Relate the principles of management with the etiology of mood disorders. •
Psychological Medicine 4	**Dr Rosliza**	**Anxiety disorders**	• Define anxiety • Explain the etiological anxiety disorders via biopsychosocial approaches. • Relate the principles of management with the etiology of anxiety disorders.

Radiology	**Husbani**	**Radiological anatomy of Nervous System**	• Identify normal radiological NS anatomy;
			  ○ Skull on plain radiograph and CT
			  ○ Intracranial structures on CT and MRI
			  ○ Spine on plain radiograph and MRI
			• Name basic view of skull and spine radiographs (i.e. AP view, lateral view, open mouth view, etc)

Clinical 1	**Prof. Madya Dr. Kyin Htwe**	**Spinal cord and peripheral nerve lesions**	• Outline nerve injury and repair. • Describe the basic pathological processes, types, classification, signs

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
			and symptoms of peripheral nerve injury. • Outline the investigations for peripheral nerve injury. • Describe the clinical features of Guillain-Barre syndrome • Describe the causes of various spinal cord lesions and their clinicopathological correlation.
Clinical 2	**Khairi**	**Neurocognitive disorders**	• Define neurocognitive disorder • List components of neurocognition and its relevant basic sciences. • Outline neurocognitive disorders. • Briefly describe common neurocognitive disorder.
Clinical 3	**HHS**	**Multiple sclerosis**	• Classify multiple sclerosis • Describe the causes of multiple sclerosis • Describe the clinical features and complications of multiple sclerosis • List the management and prognosis of multiple sclerosis
Clinical 4	**HHS**	**Comatose**	• Define the different states of reduced alertness comatose, stupor and drowsiness • State the difference between coma and related condition: vegetative state, minimally conscious, locked-in coma, brain death • Identify the causes of comatose and understand the mechanism of each cause. • List the appropriate investigation • Describe differential diagnosis of coma • Outline the general management of comatose patient
Clinical 5	**TBD**	**Increased intracranial pressure**	• Explain the physiology of intracranial perfusion pressure and control of intracranial circulation • Describe the venous drainage system of brain • Describe the process of CSF synthesis and absorption • State the aetiology of increase intracranial pressure (ICP) • Identify the presentation of patients with increased ICP • List the investigations for the diagnosis

DISCIPLINE	LECTURER	TOPIC	LEARNING OUTCOME
			• Outline the general management of increased ICP • List the complications of increased ICP

OUTLINE OF COURSE CONTENT (Practical/ECE/PBL/PPD /Seminar/Tutorial)

Type & Discipline	Lecturer	Title	Learning Outcome
Practical Anatomy 1	**AH, TFM**	**Spinal cord, brainstem, cerebral hemispheres and meninges**	• Identify the major structures of spinal cord and brainstem. • Identify the anatomical structures of cerebral hemisphere. • Study the sulci and gyri of the cerebral hemisphere. • Identify the functional areas of the cerebral hemisphere. • Identify the major blood vessels supplying the CNS. • Identify the meninges and dural venous sinuses.
Practical Anatomy 2	**NFCL, NM**	**Ventricles, thalamus, cerebellum, cranial nerves, orbit and ear.**	• Identify the anatomical structures of thalamus. • Identify the major structures of cerebellum. • Identify the structures of the orbit and ear.
Practical Histology	**NFCL**	**Histology of central nervous system and spinal cord**	• Describe the histological features of nervous tissue, cerebrum and cerebellum • Histological findings of spinal cord at cervical, thoracic, lumbar and sacral regions
Practical Physiology	**MNMN, NAAB**	**Tests for Vision and Audition**	• To conduct a series of vision associated test and in doing so, be able to describe the following: a. Blind spot b. Binocular vision and depth perception c. Near point accommodation d. Visual acuity

Type & Discipline	Lecturer	Title	Learning Outcome
			e. Astigmatism f. Pupillary reflex g. Colour blindness • To conduct a series of audition associated test and in doing so, be able to describe the following: a. Hearing acuity b. Localising sound c. Weber test d. Rinne test
Practical Pathology	**GS, NHAB**	**Histopathology of Intracranial Space Occupying Lesions**	• Discuss the histopathology, gross and microscopic description of brain tumours • Discuss the histopathology, gross and microscopic description of other space occupying lesions • Discuss the histopathology, gross and microscopic description of intracranial haemorrhage
Practical Microbiology	**NIAR, SIS**	**Laboratory diagnosis of CNS infections**	• Explain the procedure for sample collection, processing and reporting results of cerebrospinal fluid specimens • Interpret the laboratory results. • Identify the causative organisms of CNS infections • Interpret the rapid test results for CNS infections.
ECE	**Dr.Hassan Basri Dr.Azlina, Dr. Salman**	**Systemic Examination (CNS)** *Demonstrate 4 Stroke patients	Recognize these signs: • Facial asymmetry • Slurred speech • Hypertonia • Hyper-reflexia • Hemiparesis/hemiplegia • Babinski sign
PPD 12	**Prof. Dr. Tg. Mohammad Ariff**	**History of Medicine**	• Outline general overview of the history of medicine • Identify and appreciate the different scholar in the history of

Type & Discipline	Lecturer	Title	Learning Outcome
			• medicine, including Al-Razi, Ibnu Sina, Al-Zahrawi, Louise Pasteur • Outline various specialty in Medicine • Demonstrate holistic approaches in medicine
PBL Case 1	**MA, UYH, GS, NAS, MSAA, MH**	**"A ticking time bomb has exploded"**	
PBL Case 2	**MA, UYH, GS, NAS, MSAA, MH**	**"Back from the brink"**	
Seminar 1	**WMR, TZ**	**Epilepsy**	• Defined epilepsy and seizure • Know the type of epilepsy • Know the etiology of epilepsy • Explain the clinical presentation of epilepsy base on anatomy, pathophysiology of nervous system.

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BACHELOR OF MEDICINE & BACHELOR OF SURGERY (MBBS) PROGRAMME PHASE 1
(SEMESTER 1, YEAR 2)
Academic Session 2020/2021

WEEK 1	MODULE 9: NERVOUS SYSTEM								Module Coordinator: Mrs. Norhazilah Muhamad
TIME / DATE	8.30 – 9.30	9.30 – 10.00	10.00– 11.00	11.00 - 11.30	11.30 - 12.30	12.30 - 2.30	2.30 – 3.30	3.30 – 4.30	
SUN 18.10.20	Briefing of NS Module and revisit to nervous tissue **NM**		**SELF-STUDY**		Spinal cord **NM**		**Asas Pembudayaan Keusahawanan** (MPU32092) DK A **Norhilmi**		
MON 19.10.20	Brainstem **AH**				Cerebrum **TFM**		Blood supply of the nervous system **TFM**	**SELF-STUDY**	
TUES 20.10.20	Meninges & Dural sinuses **AH**		Ventricles of brain & cerebrospinal fluid circulation **NFCL**		**SELF-STUDY**		**Hubungan Etnik** (MPU31012) DK A **Faradi**		
WED 21.10.20	Thalamus and Hypothalamus **NM**		**Practical Anatomy 1** Spinal cord, brainstem, cerebral hemispheres and meninges **AH, TFM**				**Feedback for EOS 2**		
THURS 22.10.20	Basal nuclei and cerebellum **NM**		Ascending and descending tracts **AH**		The physiology of somatic sensations **NAS**		Nociception **NAS**	**SELF-STUDY**	

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WEEK 2

MODULE 9: NERVOUS SYSTEM

Module Coordinator:
Mrs. Norhazilah Muhamad

TIME / DATE	8.30 – 9.30	9.30 – 10.00	10.00 – 11.00	11.00 - 11.30	11.30 - 12.30	12.30– 2.30	2.30 – 3.30	3.30 – 4.30	
SUN 25.10.20	Autonomic nervous system **AH**		Muscle tone, posture, locomotion and the motor cortex **NAS**		Physiology of Basal ganglia and cerebellum **MMT**		**Asas Pembudayaan Keusahawanan** (MPU32092) DK A **Norhilmi**		
MON 26.10.20	Histology of the CNS **NFCL**		Brain and spinal cord tumours **GS**		Hypothalamus and eating behaviour **MMT**		Neurotransmitter 1 & 2 **HAN**		
TUES 27.10.20	**SELF-STUDY**		Spinal cord and peripheral nerve lesions **Kyin**		Thermoregulation **NAS**		**Hubungan Etnik** (MPU31012) DK A **Faradi**		
WED 28.10.20		**Practical Histology** Histology of central nervous system and spinal cord **NFCL**			Cerebrovascular diseases **NHAB**		**PBL: Case 1, Session 1** **"A ticking time bomb has exploded."** **MA, UYH, GS, NAS, MSAA, MH**		
THURS 29.10.20	**HARI KELAHIRAN NABI MUHAMMAD S.A.W (MAULIDUR RASUL)**								

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Academic Session 2020/2021

WEEK 3	**MODULE 9: NERVOUS SYSTEM**								**Module Coordinator: Mrs. Norhazilah Muhamad**
TIME / DATE	**8.30 – 9.30**	**9.30 – 10.00**	**10.00 – 11.00**	**11.00 11.30**	**11.30 - 12.30**	**12.30 – 2.30**	**2.30 – 3.30**	**3.30 – 4.30**	
SUN 1.11.20	Wakefulness, sleep and EEG **MNMN**		**TUTORIAL** Anatomy 1 **TFM, AH**		Limbic system, and learning and memory **MMT**		**Asas Pembudayaan Keusahawanan** (MPU32092) DK A **Norhilmi**		
MON 2.11.20	Bacterial Meningitis **NIAR**		Cranial nerves I (CN 1,2,3,4, & 6) **NM**		Cholinergic Drugs **SYNJ**		Brain abscess **SIS**	**PBL Case 1 Group Discussion**	
TUES 3.11.20	History of Medicine **Tg. Ariff**		Tuberculosis, cryptococcal and viral meningitis **NIAR**		**TUTORIAL** Physiology 1 **NAS, MMT**		**Hubungan Etnik** (MPU31012) DK A **Faradi**		
WED 4.11.20	**Practical Histopathology** Histopathology of Intracranial Space Occupying Lesions **GS & NHAB**				Cranial nerves II (CN 5,7 & 8) **AH**		Adrenergic Drugs **MSAA**		
THURS 5.11.20	Encephalitis **SIS**		Hypnotics and Anxiolytics **MSAA**		**SELF-STUDY**		**PBL: Case 1, Session 2** **MA, UYH, GS, NAS, MSAA, MH**		

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Academic Session 2020/2021

WEEK 4	MODULE 9: NERVOUS SYSTEM								Module Coordinator: Mrs. Norhazilah Muhamad
TIME / DATE	8.30 – 9.30	9.30 – 10.00	10.00 – 11.00	11.00 11.30	11.30 - 12.30	12.30 – 2.30	2.30 – 3.30	3.30 – 4.30	
SUN 8.11.20	Cranial nerves III (CN 9,10,11,12) **TFM**		**TUTORIAL** Pathology **GS, NHAB**		Ear **NFCL**		**Asas Pembudayaan Keusahawanan** (MPU32092) DK A **Norhilmi**		
MON 9.11.20	**Practical Microbiology** Laboratory diagnosis of CNS infections **NIAR, SIS**				Hearing **NAAB**		**PBL Case 2, Session 1** **"Back from the brink"** **MA, UYH, GS, NAS, MSAA, MH**		
TUES 10.11.20	Orbit & Eye **NFCL**		Vestibular apparatus and equilibrium **NAAB**		Vision **MNMN**		**Hubungan Etnik** (MPU31012) DK A **Faradi**		
WED 11.11.20	Vitamin A metabolism **USMR**		Learning theory & its application **Vidya**		Taste and smell **MNMN**		**Practical Anatomy 2** Diencephalon, ear and orbit **NM,NFCL**		
THURS 12.11.20	**SELF-STUDY**		Neurocognitive disorders **Khairi**		Psychosis **Khairi**		**PBL Case 2** **Group Discussion**		

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WEEK 5	MODULE 9: NERVOUS SYSTEM								Module Coordinator: Mrs. Norhazilah Muhamad
TIME / DATE	8.30 – 9.30	9.30 – 10.00	10.00 – 11.00	11.00 11.30	11.30 - 12.30	12.30- 2.30	2.30 – 3.30	3.30 – 4.30	
SUN 15.11.20	**DEEPAVALI HOLIDAY**								
MON 16.11.20	Mood disorders **Rohayah**		Development of the nervous system **AH**		Antidepressants & Mood stabilisers **MSAA**		**PBL: Case 2, Session 2** **MA, UYH, GS, NAS, MSAA, MH**		
TUES 17.11.20	**Practical Physiology** Tests for Vision and Audition **NAAB, MNMN** MKK 1 & MKK 3				Anxiety disorders **Rosliza**		**Hubungan Etnik** (MPU31012) DK A **Faradi**		
WED 18.11.20	**SEMINAR** Epilepsy **WMR, TZ**				Antipsychotics **SDA**		**TUTORIAL** Anatomy 2 **NM, NFCL**	**SELF-STUDY**	
THURS 19.11.20	Opioid Analgesics **SDA**		Anti-Parkinson and Anti-Alzheimer agents **MSAA**		General Anaesthetics **SDA**		Multiple sclerosis **HHS**	**SELF-STUDY**	

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WEEK 6	MODULE 9: NERVOUS SYSTEM								Module Coordinator: Mrs. Norhazilah Muhamad
TIME / DATE	8.30 – 9.30	9.30 – 10.00	10.00 – 11.00	11.00 11.30	11.30 - 12.30	12.30 – 2.30	2.30 – 3.30	3.30 – 4.30	
SUN 22.11.20	Anti-epileptic agents **SDA**		**ECE** Systemic Examination (CNS) **Hassan Basri, Azlina, Salman** **MKK 1 & 3**				**Asas Pembudayaan Keusahawanan** (MPU32092) DK A **Norhilmi**		
MON 23.11.20	Drug abuse and Psychostimulants **MSAA**		Increased intracranial pressure **TBD**		Comatose **HHS**		Radiological anatomy of Nervous System **Husbani**	**SELF-STUDY**	
TUES 24.11.20	**TUTORIAL** Physiology 2 **MNMN, NAAB**		**e-learning (KeLIP)** Local anesthetics **MSAA**				**Hubungan Etnik** (MPU31012) DK A **Faradi**		
WED 25.11.20	**REVISION**						**SELF-STUDY**		
THURS 26.11.20	**EOM 9 Examination (9.00 – 11.15 am)** **Online (KeLIP platform)** **Invigilator: TBD**								

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