

Nervous control, Behaviour & Special Senses- Year 2 Semester 1 Credits – 8

Duration: 08 Weeks (40 days)

	Topic/ Concept	Objectives	Time	T/L activity	Department
		Student should be able to:			
	2009-SBM-1 Overview (a) Nervous System	1. Recognize that the CNS receives sensations from receptors and .performs functions via muscles, glands etc 2. Recognize that the functional unit of the NS is the nerve cell and state the structural components of a nerve cell 3. Understand that the grey matter consists of nerve cell bodies and white matter consists of axons 4. List the major divisions of the NS eg: brain ,brain stem, spinal cord and peripheral nerves 4.1 <u>Brain</u> State the arrangement of grey matter and white Matter: Grey- cortex, thalamus, basal ganglia White- internal capsule , corpus callosum Understand the sided representation in the hemisphere Understand the concept of the homunculus List the key areas of the motor cortex and the sensory cortex 4.2 <u>Brain stem</u> List the major parts – mid brain, pons, medulla State the functional arrangement of the grey and white matter Grey-cranial nerve nuclei White- functional tracts, lemnisci ect 4.3 <u>Spinal cord</u> State the segmental arrangement, basic cross sectional arrangement and arrangement of grey and white matter 4.4 <u>Peripheral nerves</u> State the basic arrangement of spinal nerves and cranial nerves 5. Understand the concept of the upper motor neuron and the lower motor neuron in the motor pathway 6. illustrate the concept of 1 st 2 nd and 3 rd order neurons in the sensory pathway by use of a diagram	2 hr	Lecture	Physiology

(b) Head & Neck region	<ol style="list-style-type: none"> 7. Understand the arrangement of structures in the head and neck region 8. Understand the order in which the dissections of the head and neck region is done 	1 hr	Lecture	Anatomy
2009-SBM-2 Neurons and their functions (a) Structure of neurons and supporting cells and nerve fibres (b) classification	<ol style="list-style-type: none"> 1. Distinguish between neurons and neuroglial cells. 2. Describe the general structure of a neuron and explain the functions of its parts. 3. Distinguish between myelinated and nonmyelinated nerve fibers. 4. State the types and functions of neurons and neuraglia 5. Classify neurons on the basis of their structure and function 6. Name the types of sensory receptors and state their functions. 7. Describe a ganglion 8. Describe the motor end plate 	3 hrs	1hr Lecture + 2 hr Histology practical (2h x 3 groups)	Anatomy
(c) Electrical and chemical basis of nerve, muscle, NMJ, synapse, neurotransmitters and NM blockers	<ol style="list-style-type: none"> 1. Explain how a nerve impulse is transmitted across a synapse. 2. Explain the terms - excitatory postsynaptic potentials (EPSP) and inhibitory postsynaptic potentials (IPSP). 3. Define the term neurotransmitter, list the types of neurotransmitters and explain their modes of action 4. Describe the main components of the neuromuscular junction in a skeletal muscle and describe how it differs in smooth muscle. 	2hrs	1 hr lecture - NMJ + blockers 1 hr lecture - synaptic transmission	Physiology
	<ol style="list-style-type: none"> 5. Describe the sequence of events during neuromuscular transmission with special reference to acetylcholine release, acetylcholine receptors, ligand-gated ion channels, role of Ca²⁺, cholinesterases and end-plate potentials. 6. Explain the actions of different substances that stimulate or inhibit neuromuscular transmission. 	3hrs	1 hr lecture on neurotransmitters	Biochemistry

		7. Explain the derangement in neuromuscular transmission in myasthenia gravis.	2hrs	SGD- to revise RMP & AP & NMJ disorders	Physiology
2009-SBM-3 Neurotransmitters (a) Neurotransmitters and their function	<ol style="list-style-type: none"> 1. Describe the biochemical aspect of specific receptors for neurotransmitters- ionotropic receptors (ion channels) - metabotropic receptors 2. Explain the mechanism of action of receptor 3. Explain the biochemical regulation of neurotransmitters 4. State the mode of action of neurotransmitters <ul style="list-style-type: none"> ▪ γ-aminobutyric acid (GABA) ▪ Norepinephrine and epinephrine ▪ Dopamine ▪ Serotonin ▪ Acetyl choline ▪ Glutamate ▪ Nitric oxide ▪ Peptides 5. Explain how neurotransmitters act as neuromodulators 6. Recognize that all of the known amino-acid neurotransmitters are non- essential amino acids. 	7 hr	2 hr Lecture 3 hr SGD 2hr Student Seminar	Biochemistry	
(b) Neurotransmitters and disease	Biochemical basis of disorders associated with neurotransmitters Eg. Parkinson's disease, Depression, epilepsy and psychoses	4hr	2hr Lecture + 2hr SGD	Biochemistry	
(c) Vitamins and neuronal functions	List the vitamin deficiencies affecting neuronal function and outline their mechanisms.	1hr	Lecture	Biochemistry	

<p>2009-SBM-4 Head and neck regional anatomy (Including brain, spinal cord and cranial nerves. Excluding eye and ear)</p> <p>(a) Bones of the head and neck</p>	<ol style="list-style-type: none"> 1. Identify, orientate and articulate the bones of the skull, cervical vertebrae and hyoid bone including the joints 2. Identify the different regions of the vertebral column and relate them to the regions of the spinal cord 3. Describe the structure and the function of the intervertebral disc 4. Identify the skull bones and the mandible including the structures passing through the foramina 5. Identify important anatomical landmarks 6. Identify the cranial fossae 7. Describe the changes that occur in the skull and the mandible with growth 8. Describe and identify the bones that contribute to form the neck and thoracic inlet 	4hrs	1hr lecture 3hr Practical Grant's dissector (P 150-152) 13 th ed	Anatomy
(b) face	<ol style="list-style-type: none"> 1. Identify the anatomical land marks of the face ,parts of the eye, external nose and external ear 2. Be aware that the face contains muscles of expression and muscles of mastication 3. State the blood supply and the lymphatic drainage of the face. 4. Describe the attachments, actions and nerve supply of the muscles of the face 5. Demonstrate the actions of muscles of facial expression 6. Outline the sensory supply of the face 7. Surface mark the facial artery 	6hrs	Practical using prosections and dissections 3hrs x 2 (P 152-156)	Anatomy
(c) Development of the face	<ol style="list-style-type: none"> 1. Recall pharyngeal arches. 2. Describe the development of the face including the abnormalities 	1hr	lecture	Anatomy
(d) Scalp	<ol style="list-style-type: none"> 1. Describe the structure, blood supply, lymphatic drainage and the nerve supply of the scalp 2. Describe the arrangement of the tissues in the scalp and its clinical importance. 	3hrs	3hr Practical using prosections and dissections (P 156-157)	Anatomy

<p>(e) Meninges and dural venous sinuses</p>	<ol style="list-style-type: none"> 1. Name the layers of meninges and explain their function. 2. State the extent of the subarachnoid space. 3. Describe the arrangement of the dura inside the skull (Falx cerebri, Tentorium cerebelli, Dural venous sinuses) 4. Describe the arrangement of the dural venous sinuses. 	<p>4hrs</p>	<p>1 hr lecture 3hr practical using prosections (P 163-168)</p>	<p>Anatomy</p>
<p>(f) Brain, spinal cord and peripheral nerves</p> <p>i. Parts of the brain - forebrain, mid brain, hind brain</p>	<ol style="list-style-type: none"> 1. Describe the development of the brain 2. List the major parts of the brain and describe their locations 3. Describe the coverings of the brain 4. Describe the blood supply and nerve supply of the meninges 5. Describe the arrangement of gray & white matter in the brain <ol style="list-style-type: none"> a. Define the association, commissural and projection fibres and their locations b. Describe the microscopic structure of the cerebral cortex. c. Name the components of the basal ganglia 6. State the locations of functional representation in the brain. 7. Describe and identify the ventricular system of the brain and their relations. 8. State the components of the diencephalon 9. Explain briefly the structure of the thalamus and the arrangement of the thalamic nuclei. 10. Describe the external & internal morphology of the brain stem 11. Explain briefly the structure & function of the cerebellum 12. Name the afferents and efferents of the cerebellum. 13. Identify the important macroscopic structures in given specimens/sections of the brain 	<p>11hrs</p>	<p>5x1 hr lectures 6 hr Practical (each practical is 3hrs x 3 groups) using prosections</p>	<p>Anatomy</p>
<p>ii. Blood supply of the brain</p>	<ol style="list-style-type: none"> 1. Name the major arteries and their important branches that supply the brain and spinal cord 2. Describe the basic pattern of venous drainage of the brain and spinal cord 	<p>1hr</p>	<p>1h lecture 2h practical demonstration with d. above</p>	<p>Anatomy</p>

iii. Spinal cord. Peripheral nerves - cranial and spinal nerves (plexus, dermatomes etc)	<ol style="list-style-type: none"> 1. State the extent of the spinal cord in a neonate and an adult 2. State the relationship between vertebral segments and spinal segments. 3. Describe the structure of the spinal cord segment. 4. Identify the contents in the vertebral canal 5. Describe the arrangement of a typical spinal nerve 6. Define plexus and locate the major plexuses of the spinal nerves 7. Compare and contrast spinal and cranial nerves 8. List the cranial nerves 	2hrs	2 hr lecture	Anatomy
	<ol style="list-style-type: none"> 9. Describe the arrangement of main ascending and descending nerve tracts of the spinal cord. 10. Describe with reasons the clinical presentation of spinal cord lesions 	4hr	1hr lecture 3 hr practical combined with practical on parts of the brain)	
	<ol style="list-style-type: none"> 11. Name the cranial nerves 12. Describe the location of cranial nerve nuclei in the brain stem 13. Describe the distribution of the cranial nerves 14. List the functional components of cranial nerves indicating the structures supplied by them 	4hrs	2hr lectures 2 hr Practical using prosections and dissections	
	<ol style="list-style-type: none"> 15. Localize the spinal cord lesions 	2hrs	2 hr SGD	
iv. CSF	<ol style="list-style-type: none"> 1. Explain how cerebrospinal fluid is produced and its function. 2. Describe the CSF circulation with the help of a diagram 3. State the clinical importance of the interruption to CSF circulation 4. State the normal volume of CSF and its rate of production. 5. State the composition of CSF. 6. Describe the relevance of CSF examination in clinical practice 	1hr	Lecture	Physiology

	7. Describe the chemical environment of the brain with special reference to blood-cerebrospinal fluid barrier and the blood-brain barrier	1hr	Lecture	Biochemistry
vi. Intracranial haemorrhages	<ol style="list-style-type: none"> Describe the clinical importance of the middle meningeal artery and intracranial haemorrhages List the types of haemorrhages that occur within the skull. Explain the consequences of raised intracranial pressure 	1hr	1hr lecture demonstration	Anatomy
(g) Orbit	<ol style="list-style-type: none"> Describe the arrangement of bones of the orbital cavity Describe the structure, movements, blood supply and nerve supply of the eye lids Describe the lacrimal apparatus Describe the attachments and nerve supply of the muscles of the orbit and the movements of the eye Describe the facial sheath of the eye Describe the course and relations of nerves and blood vessels of the orbit Describe the component parts of the eye Describe the microscopic and macroscopic structure of the eye Describe the development of the eye Identify the component parts of the visual pathway 	7 hrs	1hr lecture 4hrs practical dissections of 2x 2hrs, whole batch (p 168-174) 2hrs histology practical and practical on models of 2hrs x 3 groups	Anatomy
	11. Discuss the clinical anatomy of the eye and the orbit	1 hr	1hr lecture by Eye Surgeon	Anatomy
(h) Ear	<ol style="list-style-type: none"> Describe the component parts of the ear Describe the microscopic and macroscopic structure of the ear Describe the development of the ear 	1hr	1hr Lecture 2hrs histology practical and practical on models (combined with eye practical)	Anatomy

		<ol style="list-style-type: none"> 4. Describe the course of the facial nerve and the relations in the ear 5. Discuss the clinical anatomy of the ear 	1 hr	1 hr lecture by ENT surgeon	Anatomy
(i) Triangles of the neck and their contents	<ol style="list-style-type: none"> 1. Describe the arrangement of deep cervical fascia in the neck 2. Describe the boundaries, contents, relations and muscles of the triangles of the neck 3. Describe the structure, relations, vasculature & nerve supply of salivary glands, thyroid and parathyroid 4. Describe the relations, vertebral levels and surface marking of the cervical part of the trachea and oesophagus . 5. describe the relations, branches and course of the great vessels of the neck 6. Describe the arrangement of cervical sympathetic trunk and its relations 	7 hrs	1hr lecture 3 hrs x 2 Practical dissections (p 174-181)	Anatomy	
(j) Fascia and Tissue spaces of the neck	Describe the arrangement of tissues in the neck including the arrangement of the fascia and the tissue spaces	1hr	Lecture	Head/Anatomy to arrange oral surgeon	
(k) Root of the neck	<ol style="list-style-type: none"> 1. Describe the boundaries and the muscles of the root of the neck 2. Describe the relations of the structures in the root of the neck 	3 hrs	3 hrs Practical Dissections (p 181-183)	Anatomy	
(l) Clinical correlations of the neck	Discuss the clinical correlations of the triangles of the neck, root of the neck and the other structures in the neck including the thyroid gland	1 hr	Lecture demonstration	Head/Anatomy to arrange a surgeon	

	(m) Temporal fossa and Parotid region	<ol style="list-style-type: none"> 1. Study the anatomical land marks and define the boundaries of the temporal fossa 2. Describe the arrangement of structures in the temporal fossa 3. Study the anatomical landmarks and define the parotid region 4. Describe the parotid bed 5. Define the extent of the parotid gland describe the relations 6. Describe the structure of the parotid gland 7. Describe the blood supply nerve supply and lymph drainage of the parotid gland 8. Surface mark the parotid duct 9. Describe the clinical importance of the parotid gland, its relations 	8hrs	(3hrs x 2)+2hrs dissections (whole batch) (P 184-187)	Anatomy
	(n) Infra temporal region and Pterygopalatine fossa	<ol style="list-style-type: none"> 1. Study the bony land marks and define the boundaries of the infra temporal fossa 2. Describe the contents and their relations including the muscles ,maxillary artery,, mandibular nerve ,otic ganglion, carotid sheath and its contents and the cranial nerves related to carotid sheath and styloid apparatus 3. Define the boundaries of the Pterygopalatine fossa 4. Describe the contents and their relations(including the maxillary nerve and pterygopalatine ganglion,) 	3hrs	3hrs Prosections and dissections (page 187-189)	Anatomy
	(o) Pharynx	<ol style="list-style-type: none"> 1. Describe the structure of the pharynx including the arrangement of the muscles, fascia and relations of the pharynx 2. Describe the blood supply lymph drainage and nerve supply of the pharynx 3. Describe the muscles involved in swallowing 	3 hrs	1 hr Lecture 2 hrs Practical using prosections and models Pharynx (p 192-195)	Anatomy

(p) Nose and Para nasal sinuses	<ol style="list-style-type: none"> 1. Describe the parts of the nose, their structure, relations blood supply and lymph drainage and nerve supply 2. Describe the bony boundaries of paranasal sinuses 3. Describe the structure, relations and the locations of para nasal sinuses and their blood supply lymphatic drainage and nerve supply 4. Describe the clinical importance of Para nasal sinuses and their relations 	3hrs	Practical using prosections and models (p 195-198)	Anatomy
(q) Soft palate and hard palate	<ol style="list-style-type: none"> 1. Describe the structure of soft palate and the hard palate 2. Describe the nerve supply of the palate 3. Describe the function of the palate in swallowing 4. Describe the development of the palate, nose and para nasal sinuses 	4 hrs	1hr lecture Practical using prosections and models Palate (p 198-202)	Anatomy
(r) Oral cavity	<ol style="list-style-type: none"> 1. Define the extent and describe the parts of the oral cavity 2. Describe the structure and nerve supply of the structures in the mouth 3. Describe the structure of the tongue and the hard palate including the arrangement of the muscles and movements 4. Describe the blood supply ,lymph drainage and nerve supply of the tongue and the hard palate 5. Describe the structure location, innervation, blood supply and lymphatic drainage of the sublingual salivary glands 6. Describe the development of tongue, palate, nose and paranasal sinuses 7. Clinical correlation of the oral cavity 	3 hrs	Practical Dissections (p 202-205)	Anatomy
(s) Larynx	<ol style="list-style-type: none"> 1. Understand the structure adapted to perform the functions of the larynx (including the skeleton of the larynx) 2. Describe the nerve supply, blood supply and the lymph drainage of the larynx 3. Describe the muscles of the larynx including their actions, blood supply and nerve supply. 	3 hrs	Practical using prosections and models Larynx (p 205-207)	Anatomy

(t) Round up session - 1	Objectives of 2008– SBM-7 / 2 sections (g), (h), (i) above	7 hrs	SGD in the form of Anatomy tutorials 2hrs x 2 3hrs of body side SGD (1/3 of batch)	Anatomy
(u) Lymph nodes and lymph drainage	Describe the arrangement of lymph nodes and lymph drainage of the head and neck including the clinical correlations.	1 hr	Lecture	Anatomy
(v) Joints	Describe the structure, movements, muscles involved and nerve supply of the TM joint, atlanto-occipital joint, atlanto-axial joints.		Lecture	
(w) Dermatomes	1. Delineate the dermatomes of the head and neck region 2. Describe the sensory supply of the head and neck region			
(x) Surface anatomy	1. Identify the anatomical landmarks in the head and neck region 2. Be able to surface mark the structures of the head and neck region			
(y) Suboccipital region	1. Identify the superficial, intermediate and deep muscles of the back. 2. Identify the bony land marks at the suboccipital region. 3. State the boundaries of the suboccipital triangle 4. Identify the structures passing over the roof of the suboccipital triangle 5. Identify/list the contents of the of the suboccipital triangle	3hrs	Practical Dissections (p 7-12) 3hr sessions	Anatomy
(z) Round up session-2		4hrs	SGD in the form of Anatomy tutorials 2hrs x 2 2hrs of round up lecture	Anatomy
2009-SBM-5 How brain receives information				
(a) General sensations	1. List the general sensations and sensory receptors.	2hrs	1hr L - Sensory	Physiology

	<ol style="list-style-type: none"> 2. Name the ascending pathways 3. State the functional localization of the cerebral cortex 4. List the general sensations and special sensations 		receptors 1 hr.L - ascending pathways; Sensory cortex	
(b) Special sensations (i) Physiology of vision	<ol style="list-style-type: none"> 1. Explain the basic principles underlying the optics of vision 2. List the errors of refraction, describe how they occur and explain the basis of correcting each of them. <ol style="list-style-type: none"> 1. Explain the term accommodation as applied to the eye. 2. Explain the basis of the accommodation-convergence reflex and pupillary light reflex. 3. Explain the principles underlying visual acuity 4. Describe the functions of the retina including photochemistry of vision 5. Explain the mechanisms of dark and light adaptation. 6. State the different types and explain the genetic basis of colour blindness. 7. Draw a labelled diagram showing the visual pathway from the retina up to the occipital cortex and describe the effects on visual function caused by lesions at the following sites: optic nerve, optic chiasma, optic tract, optic radiation and occipital cortex 	4 hrs	Lecture	Physiology
(ii) Testing of visual acuity (near & distant vision) and colour vision	<ol style="list-style-type: none"> 1. Describe the tests used to assess visual acuity (near and distant vision) and colour vision using Snellen's charts, Jaeger charts and Ishihara charts and interpret the results 2. Examine the optic fundus using an ophthalmoscope 3. Describe the tests used to assess visual fields (confrontation test and perimetry) & and interpret the findings 	2 hrs	Practical	Physiology
(iii) Physiology of hearing (properties of sound and transmission of sound)	<ol style="list-style-type: none"> 1. Explain the properties of sound with special reference to frequency and loudness. 2. Recognise that the sound can be transmitted by air conduction and bone conduction. 3. Describe the functions of the cochlea: transmission of sound waves in the cochlea and the receptor function of the organ of Corti. 4. Trace the pathway through which impulses are transmitted from the auditory nerve through the brain stem tracts up to the temporal cortex 	2hr	Lecture	Physiology

(iv) Tests of hearing	<ol style="list-style-type: none"> 1. Perform Rinne's and Weber's tests and interpret results 2. Perform an auriscopic examination and identify the anatomical structures in a normal ear 3. Interpret the findings in pure tone audiometry 	2hrs	Practical	Physiology
(v) Smell and taste	<ol style="list-style-type: none"> 1. Describe the functional anatomy of the olfactory membrane. 2. Explain how olfactory receptors are stimulated. 3. Describe the olfactory pathway 4. Describe the functional anatomy of taste buds and state their locations. 5. State the primary taste modalities. 6. Explain the term taste threshold 7. Describe the taste pathway 8. Explain the role of smell and taste in the perception of "flavour" 	1hr	Lecture	Physiology
(vi) Pain	<ol style="list-style-type: none"> 1. Explain what is meant by the term 'pain' and state the different types of pain (somatic, visceral, neuropathic) 2. Explain terms used to describe different states of pain perception: hyperesthesia , allodynia, hyperalgesia, neuralgia, analgesia, anaesthesia, paraesthesia 3. State the main features of nociceptors. 4. List the stimuli that can excite nociceptors and explain the role of prostaglandins in sensitizing the nociceptors 5. Trace the ascending pathway through which pain impulses are transmitted. 6. List the components of the descending pain inhibitory pathway 7. Describe the central projections of the pain pathway and explain their role in pain perception. 8. Describe the role of substance P in pain impulse transmission 9. Describe the descending pain modulatory system. 10. List the opioid peptides that are involved in pain inhibition and describe their actions. 11. Discuss the gate-control theory of pain. 12. Explain the role of other neurotransmitters involved in pain modulation 	2hrs	Lecture	Physiology

(vii) Psycho-social aspects of pain	<ol style="list-style-type: none"> 1. Describe the physiological basis of different methods of pain relief 2. Discuss the clinical applications of different methods of pain relief 3. Discuss how pain is modulated by emotions and the psychological aspects of perception of pain 	2 hrs	Staff seminar Physiology, Anaesthesiology, Psychiatry	Physiology, Anaesthesiology, Psychiatry
(viii) Round up session -3		2 hr	SGD on all special senses	Physiology
2009-SBM-6 How brain responds (Motor system)	<ol style="list-style-type: none"> 1. State the locations of the motor areas of the cortex Describe the descending tracts 	2hrs	2hrs lecture	Physiology
(a) Reflexes and control of motor functions	<ol style="list-style-type: none"> 1.Explain the physiological basis of reflexes 2.Recall the mechanism of stretch reflex 3.Explain the basis of Golgi tendon reflex, the withdrawal reflex ,crossed extensor reflex. and primitive reflexes 4.Discuss the supraspinal control of spinal cord reflexes. 5.Recall the term muscle tone and the role of the gamma motor neurone in maintaining muscle tone 6.Recall the functional anatomy of motor cortex and motor pathways 7.Describe the cortical & brain stem control of motor functions 8.Explain the functions of the reticular formation 9.Explain the physiological basis of the clinical features of upper motor and lower motor neuron lesions 	6 hrs	4 hr lectures 2hrs SGD	Physiology
(b) Cerebellum and motor coordination	<ol style="list-style-type: none"> 1. Describe the functional anatomy of the cerebellum and its main input and output connections. 2. Explain the role of the cerebellum in motor coordination, posture, balance and muscle tone. 3. List the clinical features seen in cerebellar disorders and explain the physiological basis of each of them. 	1 hr	1 hr lecture	Physiology

(c) Basal Ganglia	<ol style="list-style-type: none"> 1. Name the basal ganglia and state their locations. 2. Explain the role of the basal ganglia in motor functions. 3. List the neurotransmitters in the basal ganglial circuits and state their functions. 4. Describe the clinical features of basal ganglia dysfunction. 	2hrs	2 hrs lecture	Physiology
(d) Posture	<ol style="list-style-type: none"> 1. List the sensory inputs, the levels of integration and the reflexes involved in the maintenance of posture. 2. Describe the mechanisms integrated at the spinal cord level including stretch reflexes, positive supporting reaction, negative supporting reaction and righting reflexes 3. Discuss the effects of transection of spinal cord and brain stem at different levels explaining the phenomena – spinal shock, decerebrate rigidity and decorticate rigidity 	2 hrs	2 hr lecture	Physiology
(e) Physiology of Balance	<ol style="list-style-type: none"> 1. Describe the functions of the vestibular apparatus: semicircular canals, utricle and saccule. 2. Describe the afferent and efferent connections of the vestibular nuclei. 3. Explain the role of the vestibular apparatus and the vestibular nuclei in maintenance of posture and balance. 4. Explain the physiological basis of nystagmus. 5. List the tests used to assess balance and explain their basis. 	2 hrs	Lectures	Physiology
(f) Round-up Session -4	Objectives of 2008-2 / SBM-8/5 above	2 hr	SGD on motor system (nerve lesion)	Physiology

2009-SBM-7 Autonomic nervous system	Compare and contrast the sympathetic and parasympathetic divisions, in terms of <ul style="list-style-type: none"> ▪ stimulatory and inhibitory actions on different organs ▪ stimulatory and inhibitory drugs that act on the autonomic receptors (eg:- atropine, adrenaline, propranolol, salbutamol) ▪ Describe the distribution of the different branches of the sympathetic and parasympathetic systems and their effects on each organ system. ▪ Describe the autonomic reflexes concerned with different organ systems. 	1hr	Lecture	Physiology
2009-SBM-8 Lesions of the spinal cord and peripheral nerves		5hrs	CCR in 2 x 2hr +1 sessions	Anatomy
2009-SBM-9 Mind & Behaviour in relation to neuronal function (a) Psychological aspects of higher functions	<ol style="list-style-type: none"> 1. Explain the term 'higher mental processes'. 2. Describe the psychological aspects of memory, cognition, reasoning, language, emotion and other higher functions 3. Describe the theories of learning. 6. Discuss the concept of consciousness (definition, basis, assessment) 	1hr	Lecture	Psychiatry
(b) Physiology of memory and functions of the limbic system	<ol style="list-style-type: none"> 1. Describe the physiological basis of memory 2. Describe the terms: immediate, short-term and long-term memory. 3. Explain the mechanisms involved in the storage of information. 4. State the brain areas involved in memory. 5. Describe the functions of the limbic system 	2 hrs	Lecture	Physiology

(c) Speech and language	<ol style="list-style-type: none"> 1. Describe the structures and mechanisms involved in phonation and articulation. 2. Describe the mechanisms involved in central control of speech. 3. List the disorders of speech and explain the mechanisms of their causation. 	1 hr	Lecture	Physiology
(d) Sleep and arousal	<ol style="list-style-type: none"> 1. State the different stages of sleep and describe a typical sleep cycle. 2. Compare and contrast slow wave sleep and REM sleep. 3. Discuss the role of the reticular system in arousal and sleep. 4. State the neurotransmitters involved in arousal and sleep. 5. Explain the physiological basis of electroencephalography (EEG). 6. State the different waves seen in a typical EEG tracing. 7. Describe the EEG patterns seen in different stages of sleep. 	2 hrs	Lecture	Physiology
2009-SBM-10 Physical examination of the nervous system (a) Motor (b) Sensory (c) Cranial nerves	Perform complete clinical examination of the nervous system	9 hrs	3 hr practical Sessions for each section – 1/3 of the batch	Physiology
2009-SBM-11 Investigation of neural functions	Explain the basis of neurophysiological tests and be able to understand their results.	2 hrs	Practical	Physiology
2009-SBM-12 Appearance of the brain and spinal cord on imaging	List the structures that could be identified in the brain spinal cord, CSF pathway, and the vasculature by radiological imaging.	1hr	1 hr lecture	Radiology

Nervous control, behaviour & special senses module – (Year 2 Semester 1)

Module Summary

	Lectures (hrs)	PD (hrs)	CCR (hrs)	SGD (hrs)	Student Seminar (hrs)	Staff Seminar (hrs)	Total (hrs)
Anatomy	20	74	5	9			106
Biochemistry	7			7	2		16
Physiology	37	15		8			62
Anaesthesia						2	2
Psychiatry	1						3
Radiology	1						1
Total	66	89	5	24	2	2	190

Names and departments of the teachers involved in the teaching programme:

Dept. of Anatomy

Prof. M. Chandrasekera
Dr. S.B. Adikari
Dr. D. Nanayakkara
Dr. H. Amarathunge

Dept. of Biochemistry

Prof. R. Sivakanesan
Dr. H.K.I. Perera
Dr. P.H.P. Fernando
Dr. JG.S. Ransinghe
Dr. W.I.T. Fernando

Dept. of Anaesthesiology

Dr. V. Pinto

Dept. of Physiology

Dr. V Weerasinghe

Radiology

Dr. B. Hewawithane

Dept. of Psychiatry

Dr. T. Rajapakse
Ms. S. Govipalgoda

Examination Format

Module	Credits	Total duration of examination	MCQ	SAQ	OSPE
Nervous control, Behaviour & Special Senses	8	4	1	1 ½	1 ½