

NEUROSCIENCE STUDY GUIDE

KGMC

This Study guide of the module/course outlines the key components and areas for the facilitation of the students.

Department of Medical Education

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Khyber Medical University: Vision.....

Khyber Girls Medical College: Vision.....

Khyber Girls Medical College: Mission.....

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Module committee.....

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PSYCH OMOTOR.....

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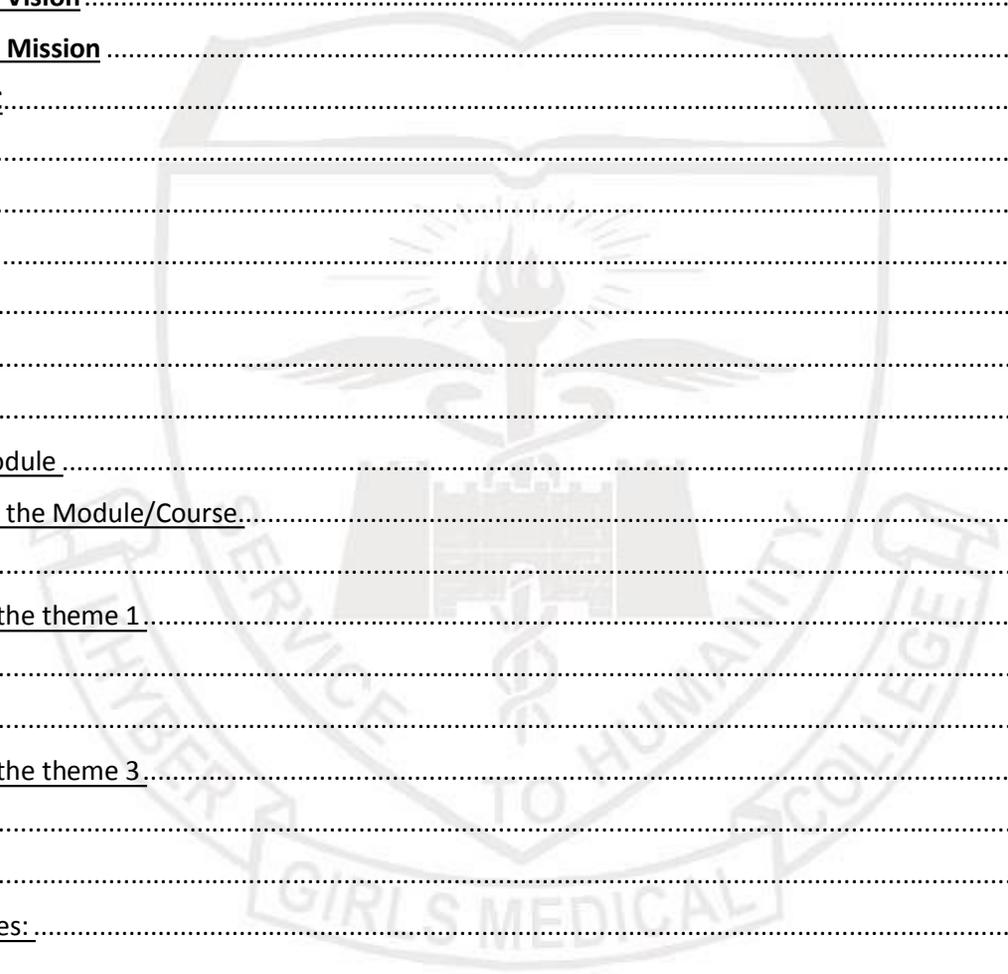
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Vision and Mission of KGMC

Khyber Medical University: Vision



Khyber Medical University will be the global leader in health sciences academics and research for efficient and compassionate health care.

Khyber Girls Medical College: Vision



“Excellence in health care, research, teaching and training in the service of Humanity”

Khyber Girls Medical College: Mission

The mission of KGMC is to promote compassionate and professional health care leaders Who are knowledgeable, skillful, and community oriented lifelong learners serving humanity through evidence based practices.

Curriculum Committee KGMC

Chair:

Professor Dr.Zahid Aman, Dean KGMC.

Co-Chair:

Dr. Sabina Aziz, Associate Dean KGMC.

Clinical Sciences:

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- Dr. Ghareeb Nawaz Department of ENT KGMC/HMC.
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- Dr. Ambreen Ahmad, Department of Pediatrics KGMC/HMC.
- Dr. Ain-ul-Hadi Department of Surgery KGMC/HMC.
- Dr. Fawad Rahim Department of Medicine KGMC/HMC.

Behavioral Sciences:

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- Dr. Khalid Javed Department of Pathology, KGMC.
- Dr. Raheela Amin Department of Community Medicine, KGMC.
- Dr. Shams Suleman Department of Pharmacology, KGMC.
- Dr. Shahab-ud-Din, Department of Anatomy, KGMC.
- Dr. Zubia Shah Department of Physiology, KGMC.
- Dr. Naheed Siddique Department of Forensic Medicine, KGMC.



Integrated curriculum:

An integrated curriculum is all about making connections, whether to real life or across the disciplines, about skills or about knowledge. An integrated curriculum fuses subject areas, experiences, and real-life knowledge together to make a more fulfilling and tangible learning environment for students. Integrated teaching means that subjects are presented as a meaningful whole. Students will be able to have better understanding of basic sciences when they repeatedly learn in relation to clinical examples. Case based discussions, computer-based assignments, early exposure to clinics, wards, and skills acquisition in skills lab are characteristics of integrated teaching program.

Outcomes of the curriculum:

The Curricular Outcomes of the MBBS Program for a Graduating Doctor according to the PMDC are as follows:

1. Knowledgeable

Knowledgeable about the diseases and health conditions prevalent in the population of Pakistan and use Evidence-based medicine to provide best possible cost-effective care.

2. Skillful

Skillful in History taking and Physical examination to compassionately deal with a patient.

3. Community health promoter

Take appropriate decisions and actions for protecting and promoting the health of their community.

4. Critical Thinker

Evaluate critically the patient data to effectively deal with complexity of medical decisions for the best possible outcomes using evidence-based practices in service of humanity.

5. Professional

Display professional values (honesty, accountability, cultural and religious sensitivity), attitudes and behaviors (empathy, ethics, good communication skills and lifelong learner) that embody good medical practice.

6. Researcher

Exhibit a spirit of inquisitiveness, inventiveness, and ethical conduct while carrying out research in accordance with the prescribed guidelines.

7. Leader and role Model

Demonstrate exemplary conduct and leadership in Advancing healthcare, enhancing medical education, and Enhancing the trust of the public in the medical profession by being exceptional role models.

KNOWLEDGE

By the end of five year MBBS program the KGMC student should be able to;

- Acquire a high level of clinical proficiency in history taking, physical examination, differential diagnosis, and the effective use of Medicine's evolving diagnostic and procedural capabilities including therapeutic and palliative modalities
- Manage the common prevalent diseases in community
- Identify the common medical emergencies
- Develop plan for prevention of common community diseases
- Formulate a referral plan
- Compose a prescription plan

PSYCHOMOTOR

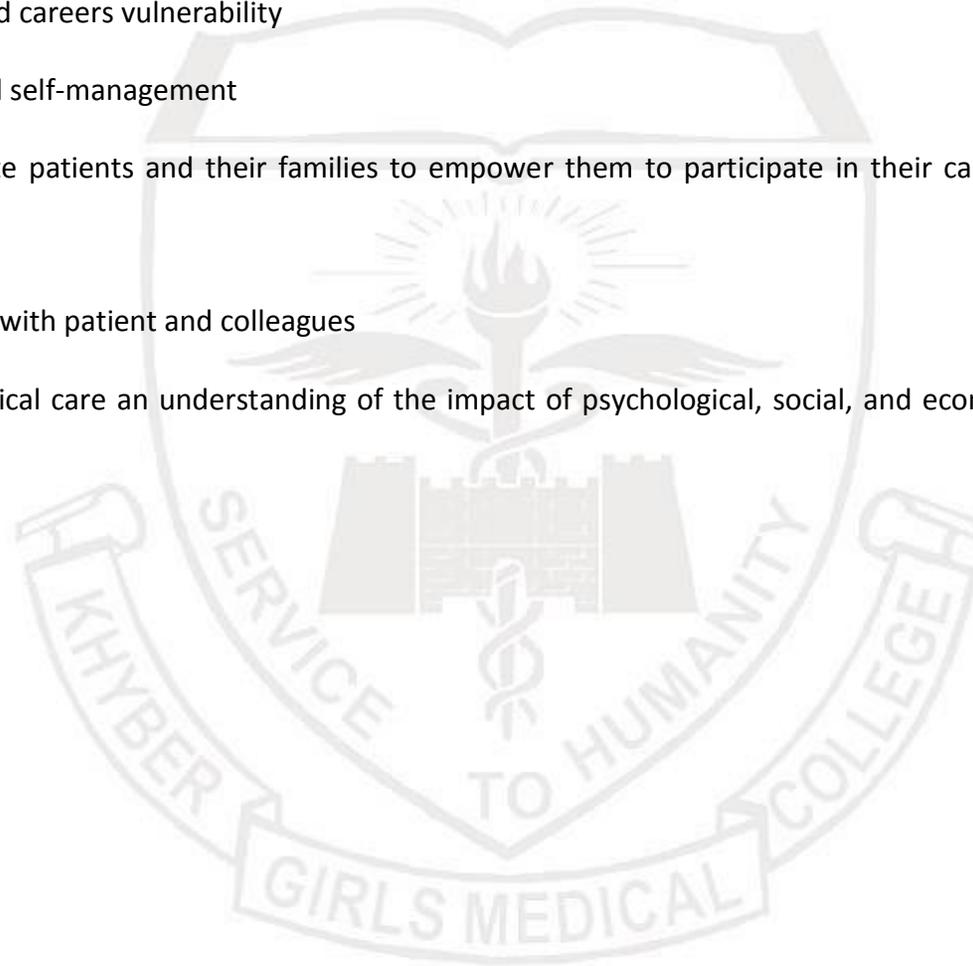
By the end of five year MBBS program the KGMC student should be able to;

- Demonstrate the ability to perform the disease specific relevant examination
- Respond to common medical emergencies
- Master the skill of first aid
- Perform BLS
- Apply the best evidenced practices for local health problems

AFFECTIVE

By the end of five year MBBS program the KGMC student should be able to

1. Relate to patient and caregivers vulnerability
2. Demonstrate ethical self-management
3. Counsel and educate patients and their families to empower them to participate in their care and enable shared decision-making.
4. Display compassion with patient and colleagues
5. Demonstrate in clinical care an understanding of the impact of psychological, social, and economic factors on human health and disease



Introduction to the Course/Module

Neurosciences course module 2
Total 5 weeks
curriculum committee Khyber medical university

- Facial palsy (face, 5th and 7th cranial nerves) 1 week
- Neck swelling (thyroid, larynx, neck, muscles etc) 1 week
- Cleft palate (palate, tongue, pharynx) 1 week
- Ansomia 1 week
- Diplopia / blindness
(2nd, 3rd, 4th, 6th cranial nerve / eye ball / orbit) 1 week
- Deafness (ear / 8th nerve) 1week

This is neuroscience module aimed at learning different areas of brain and its working, along with Different pathologies associated with it.

General Learning Outcomes of the Module/Course

By the end of this module the students should be able to;

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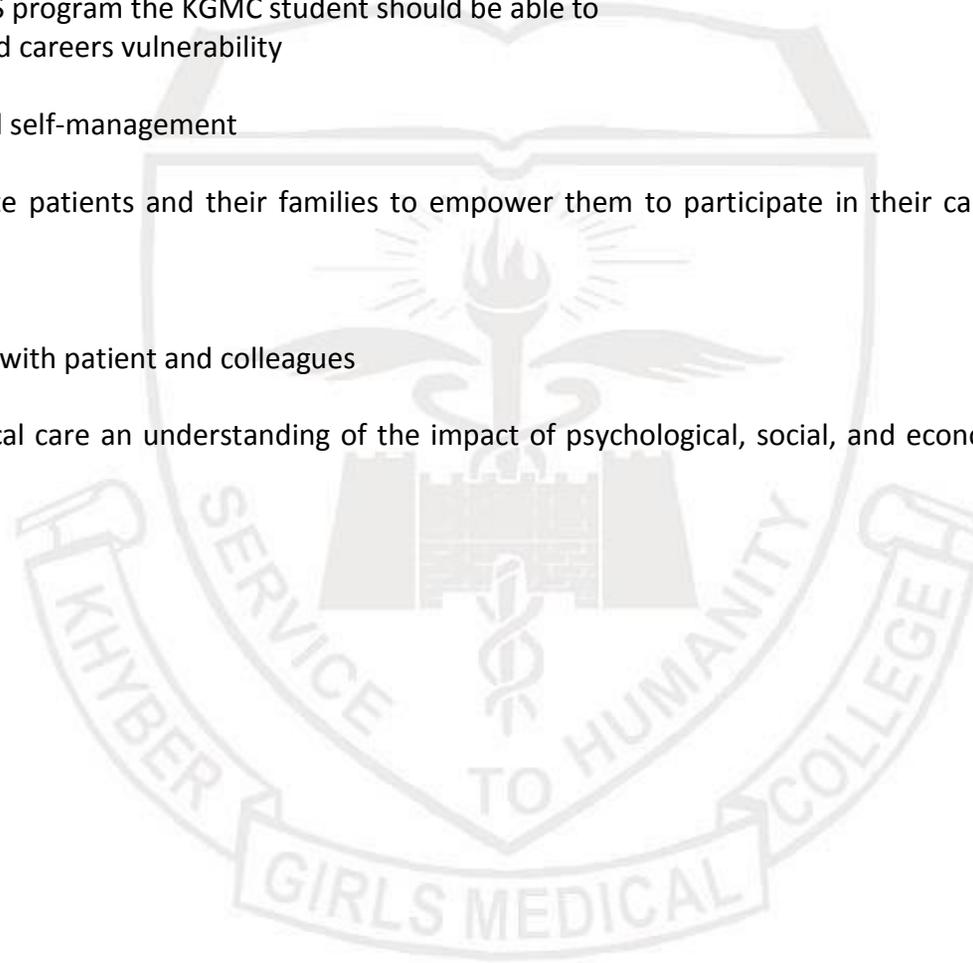
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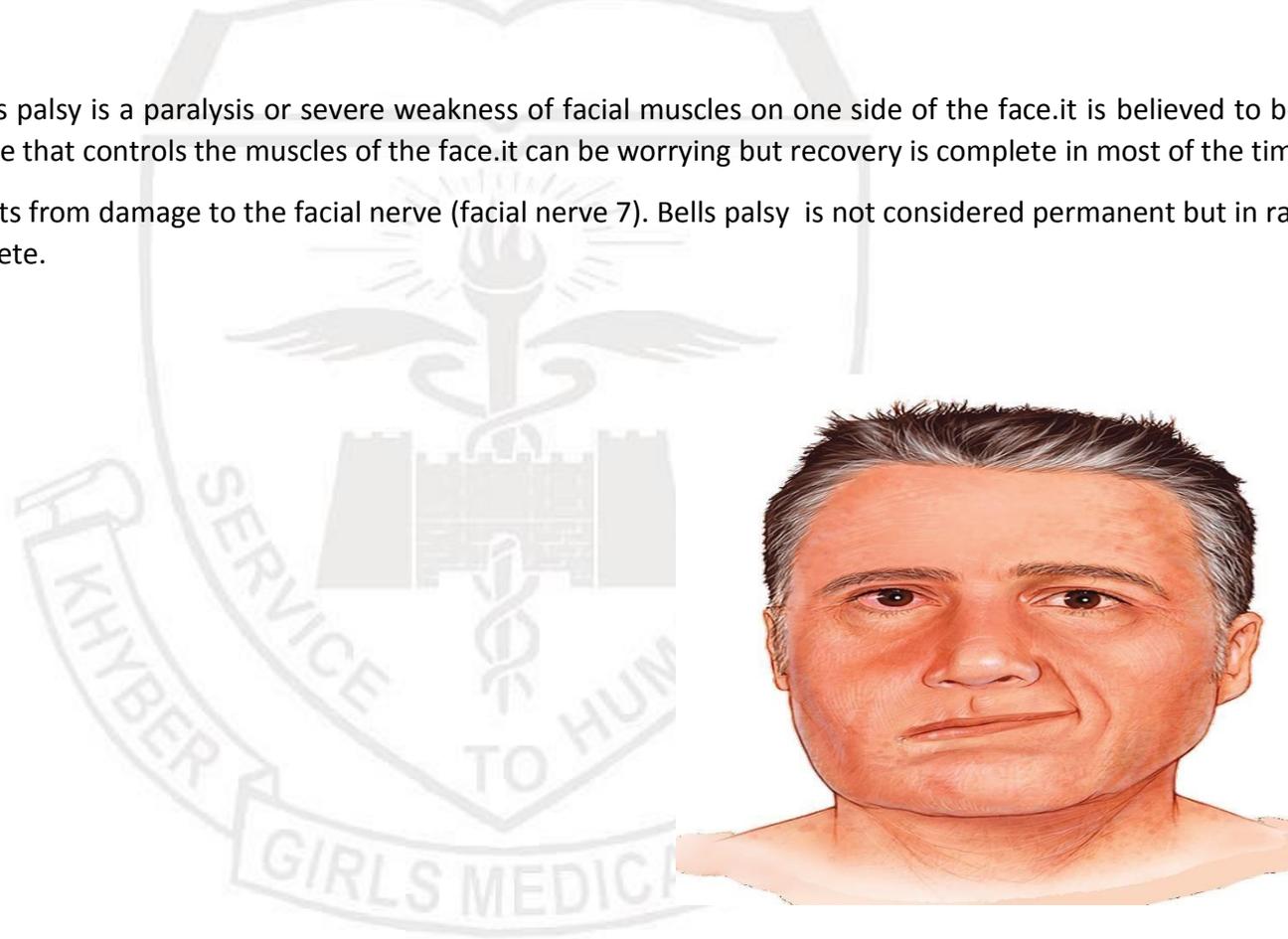


Theme 1

Facial palsy

Facial palsy or bells palsy is a paralysis or severe weakness of facial muscles on one side of the face. it is believed to be due to swelling of the nerve that controls the muscles of the face. it can be worrying but recovery is complete in most of the times

This condition results from damage to the facial nerve (facial nerve 7). Bells palsy is not considered permanent but in rare cases recovery not complete.



Specific learning objectives of the theme 1

Topic	Learning Objectives	MIT	Assessment
Gross Anatomy			
Osteology of mandible	Describe the gross features of adult mandible.	DISSECTION/DEMO	MCQ,OSPE
	Describe the bony features of mandible	DISSECTION/DEMO	MCQ,OSPE
	Name the joints formed by mandible	DISSECTION/DEMO	MCQ,OSPE
	Name the attachment of muscles and ligaments on mandible	DISSECTION/DEMO	MCQ,OSPE
Norma frontalis	Describe the bony features of frontal view of skull	DISSECTION/DEMO	MCQ,OSPE
Norma basalis	Name the bones forming the base of skull	DISSECTION/DEMO	OSCQ.MCQ
	Name the bony features	DISSECTION/DEMO	MCQ,OSPE
	Identify the different foramina and name the structures passing through these foramina	DISSECTION/DEMO	MCQ,OSPE
	Describe the attachment and relation of base of skull	DISSECTION/DEMO	MCQ,OSPE
	Describe the clinical importance	DISSECTION/DEMO	MCQ,OSPE

Norma lateralis	Name the boundaries of temporal fossa	DISSECTION/DEMO	MCQ,OSPE
	Enumerate the contents of temporal fossa	DISSECTION/DEMO	MCQ,OSPE
	Describe the relations of temporal fossa	DISSECTION/DEMO	MCQ,OSPE
	Name the boundaries of infratemporal fossa	DISSECTION/DEMO	MCQ,OSPE
	Enlist the contents of fossa	DISSECTION/DEMO	MCQ,OSPE
	Describe the relations of Infratemporal fossa	DISSECTION/DEMO	MCQ,OSPE
	Name the layers of scalp	DISSECTION/DEMO	MCQ,OSPE
Scalp and muscles of facial expression	Describe the muscles of scalp	DISSECTION/DEMO	MCQ,OSPE
	Name the neurovascular supply of scalp	DISSECTION/DEMO	MCQ,OSPE
	Describe the lymphatic drainage of scalp	DISSECTION/DEMO	MCQ,OSPE
	Name the facial muscles along with attachments, nerve supply and actions	DISSECTION/DEMO	MCQ,OSPE
Muscles of mastication	Enumerate the muscles of mastication along with their attachments, nerve supply and actions	DISSECTION/DEMO	MCQ,OSPE
Blood supply and lymphatic drainage of face	Describe the blood supply and lymphatic drainage of face portion	LGF	MCQ,OSPE
Temporomandibular joint	Name the type of TMJ	LGF	MCQ,OSPE

	Name the ligaments related with TMJ	LGF	MCQ,OSPE
	Describe the relations of TMJ	LGF	MCQ,OSPE
	Name the muscles causing movements of TMJ	LGF	MCQ,OSPE
	Name the neurovascular supply of TMJ	LGF	MCQ,OSPE
Extra cranial course of CN VII	Describe the extra cranial course of CN VII along with its clinical importance	LGF	MCQ,OSPE
Embryology			
Face development	Discuss the five facial primordia	LGF	MCQ
	Describe the inter-maxillary segment	LGF	MCQ
	Describe the embryological defects of face	LGF	MCQ
Histology			
Parotid glands	Identify the variety of gland according to nature of its acinus	LGF	MCQ
	Discuss the capsular structure and its extensions in the gland	LGF	MCQ
	Differentiate between the stroma and parenchyma of parotid gland	LGF	MCQ
	Describe the ductal system of the gland and its lining epithelium	LGF	.MCQ

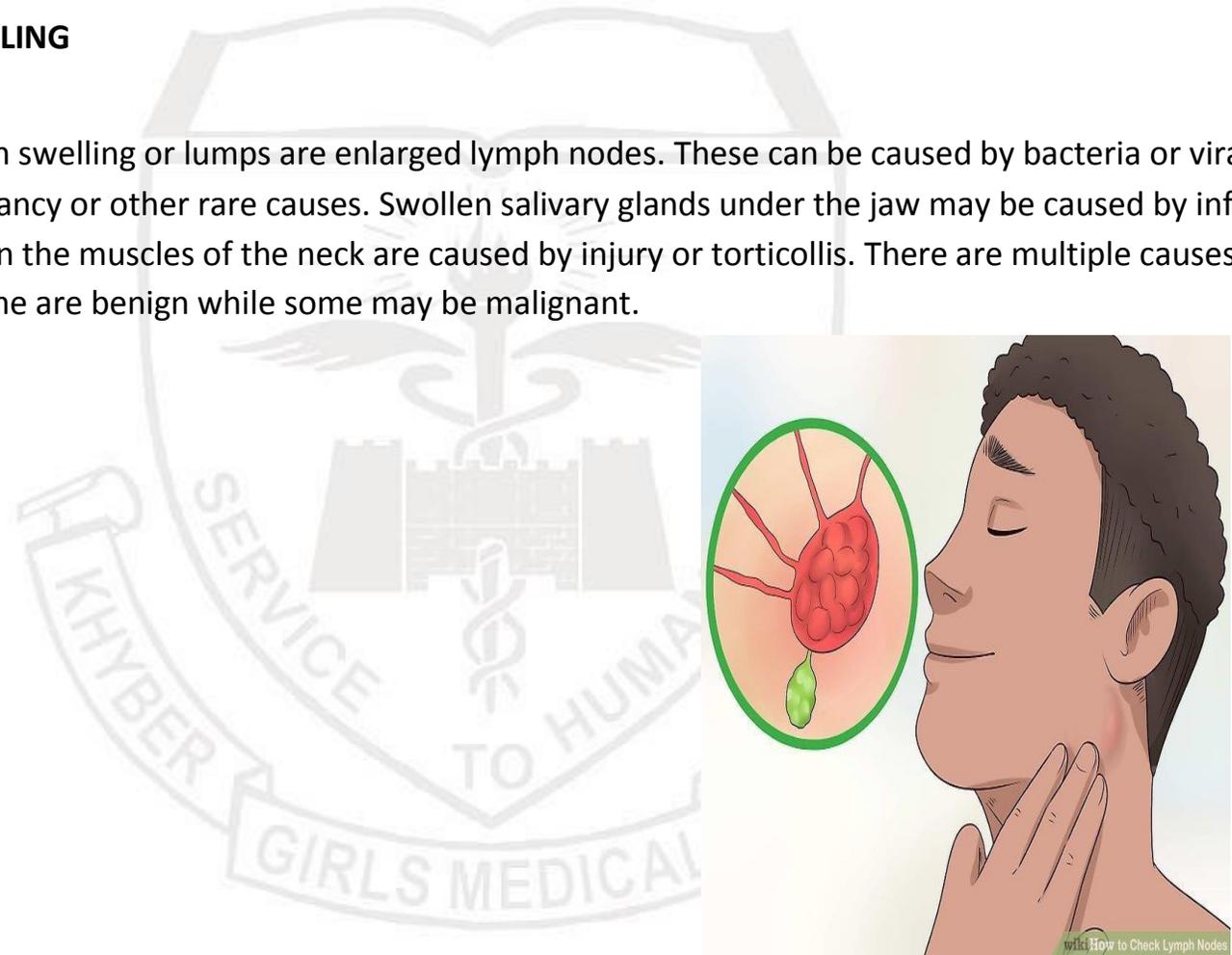
	Differentiate between the intercalated and striated ducts in intralobular parts of gland	LGF	MCQ,OSPE
	Describe the detailed structure of serous acinus	LGF	MCQ,OSPE
	Discuss the location of stensons duct and its structure	LGF	MCQ,OSPE
	Discuss clinical conditions related with parotid gland	LGF	MCQ,OSPE
Biochemistry			
Biotechnology	Describe the indications and procedure of Polymerase Chain Reaction (PCR), Cloning and Restriction fragment length polymorphism (RFLP)	LGF	MCQ
Purine Nucleotide synthesis and degradation	Describe the process of nucleotide synthesis and degradation	LGF	MCQ
Hyperuricemia- Gout	Describe the normal levels of serum Uric acid in the blood	LGF	MCQ
	Describe the mechanism of synthesis of Uric acid from Purines	LGF	MCQ
	Describe the etiology, pathogenesis and clinical features of Gout	LGF	MCQ
Pyrimidine Nucleotide synthesis and degradation	Describe the mechanisms of Pyrimidines synthesis and degradation	LGF	MCQ
Salvage pathway of nucleotide synthesis	Explain the salvage pathway of Nucleotide synthesis	LGF	MCQ

The structural basis of cellular information	Explain the structural basis of cellular information	LGF	MCQ
DNA, chromosomes, discovery and organization in genome	Explain the structure, organization and functions of Chromosomes, DNA and genes	LGF	MCQ
DNA replication	Describe the process of DNA replication	LGF	MCQ
Transcription	Describe the mechanism of transcription	LGF	MCQ
Protein synthesis	Explain the mechanisms of protein synthesis	LGF	MCQ
Mutation	Define mutation	LGF	MCQ
DNA, damage and repairs	Explain the mechanisms of DNA damage and repair	LGF	MCQ
General Medicine			
Bell`s palsy	Describe the clinical features and management of Bell`s palsy	LGF	MCQ
Skills and affective domain			
Histology			
Submandibular and Sublingual Salivary Gland	Identify the slide of submandibular and sublingual salivary glands under the microscope	PRACTICAL/DEMO	MCQ,OSPE
Physiology			
Examination of Cranial nerves, V, VII	Examine the cranial nerves I & VII on a standardized patient	PRACTICAL/DEMO	MCQ,OSPE

Theme 2

NECK SWELLING

The most common swelling or lumps are enlarged lymph nodes. These can be caused by bacteria or viral infections, malignancy or other rare causes. Swollen salivary glands under the jaw may be caused by infection or cancer. Lumps in the muscles of the neck are caused by injury or torticollis. There are multiple causes of neck swelling, some are benign while some may be malignant.



Specific Learning Objectives of the Theme 2

Topic	Learning objectives	Teaching strategy	Assessment
Gross Anatomy			
Typical cervical vertebra	Describe the bony features of typical cervical vertebrae	DISSECTION/DEMO	MCQ, OSPE
	Name the joints formed by typical vertebrae	DISSECTION/DEMO	MCQ, OSPE
	Describe the attachments	DISSECTION/DEMO	MCQ, OSPE
Atypical cervical vertebra	Describe the bony features of atypical cervical vertebrae	DISSECTION/DEMO	MCQ, OSPE
	Name the joints formed by atypical vertebrae	DISSECTION/DEMO	MCQ, OSPE
	Describe the attachments	DISSECTION/DEMO	MCQ, OSPE
Hyoid bone	Describe the bony features of hyoid bone	DISSECTION/DEMO	MCQ, OSPE
	Describe the attachments of muscles and ligaments with hyoid bone	DISSECTION/DEMO	MCQ, OSPE
Pterygopalatine fossa	Name the boundaries of pterygopalatine fossa	DISSECTION/DEMO	MCQ, OSPE
	Enumerate the contents of pterygopalatine fossa	DISSECTION/DEMO	MCQ, OSPE
	Describe the relations of pterygopalatine fossa	DISSECTION/DEMO	MCQ, OSPE

Deep fascia of neck	Enumerate the layers of deep cervical fascia	LGF	MCQ,OSPE
	Draw and labelled diagram of transverse section of neck showing deep cervical fascia	LGF	MCQ,OSPE
	Describe the layers of deep cervical fascia along with its clinical importance	LGF	MCQ,OSPE
Larynx	Name the paired and unpaired cartilages of larynx	DISSECTION/DEMO	MCQ,OSPE
	Enumerate the ligaments and membrane of larynx	DISSECTION/DEMO	MCQ,OSPE
	Describe the sensory and blood supply of larynx	DISSECTION/DEMO	MCQ,OSPE
	Enumerate the intrinsic and extrinsic muscle of larynx along with its actions and nerve supply	DISSECTION/DEMO	MCQ,OSPE
	Describe the pyriform fossa	DISSECTION/DEMO	MCQ,OSPE
Ant. triangle of neck	Enlist the subdivisions of anterior triangle of neck	LGF	MCQ,OSPE
	Describe the boundaries and contents of submental triangle	LGF	MCQ,OSPE
	Describe the boundaries and contents of carotid triangle Describe the boundaries and contents of digastric triangle Describe the boundaries and contents of muscular triangle	LGF	MCQ,OSPE
Post triangle of neck	Enlist the subdivisions of posterior triangle of neck	LGF	MCQ,OSPE
	Describe the boundaries and contents of occipital triangle	LGF	MCQ,OSPE

	Describe the boundaries and contents of supraclavicular triangle	LGF	MCQ,OSPE
Arteries of neck	Describe the course, Distribution and branches of main arteries of neck	LGF	MCQ,OSPE
veins of neck	Describe the course, Draining and tributaries of main veins of neck	LGF	MCQ,OSPE
cervical plexus and nerves of neck	Describe the cervical plexus along with its branches and distribution	LGF	MCQ,OSPE
Embryology			
Pharyngeal apparatus	Describe the components of pharyngeal apparatus.	LGF	MCQ,OSPE
	Describe the development of pharyngeal apparatus	LGF	MCQ,OSPE
	Enlist the derivatives of the first pharyngeal arch	LGF	MCQ,OSPE
	Define the terms pharyngeal arch, pouch, cleft and membrane	LGF	MCQ,OSPE
	Enumerate the derivatives of the second pharyngeal arch	LGF	MCQ,OSPE
	Enumerate the derivatives of the 3 rd pharyngeal arch	LGF	MCQ,OSPE
	Enumerate the derivatives of the 4 th pharyngeal arch	LGF	MCQ,OSPE
	Enlist the derivatives of 1 st , 2 nd , 3 rd and 4 th pharyngeal pouches	LGF	MCQ,OSPE
	Describe the derivatives of pharyngeal, grooves, and membranes	LGF	MCQ,OSPE

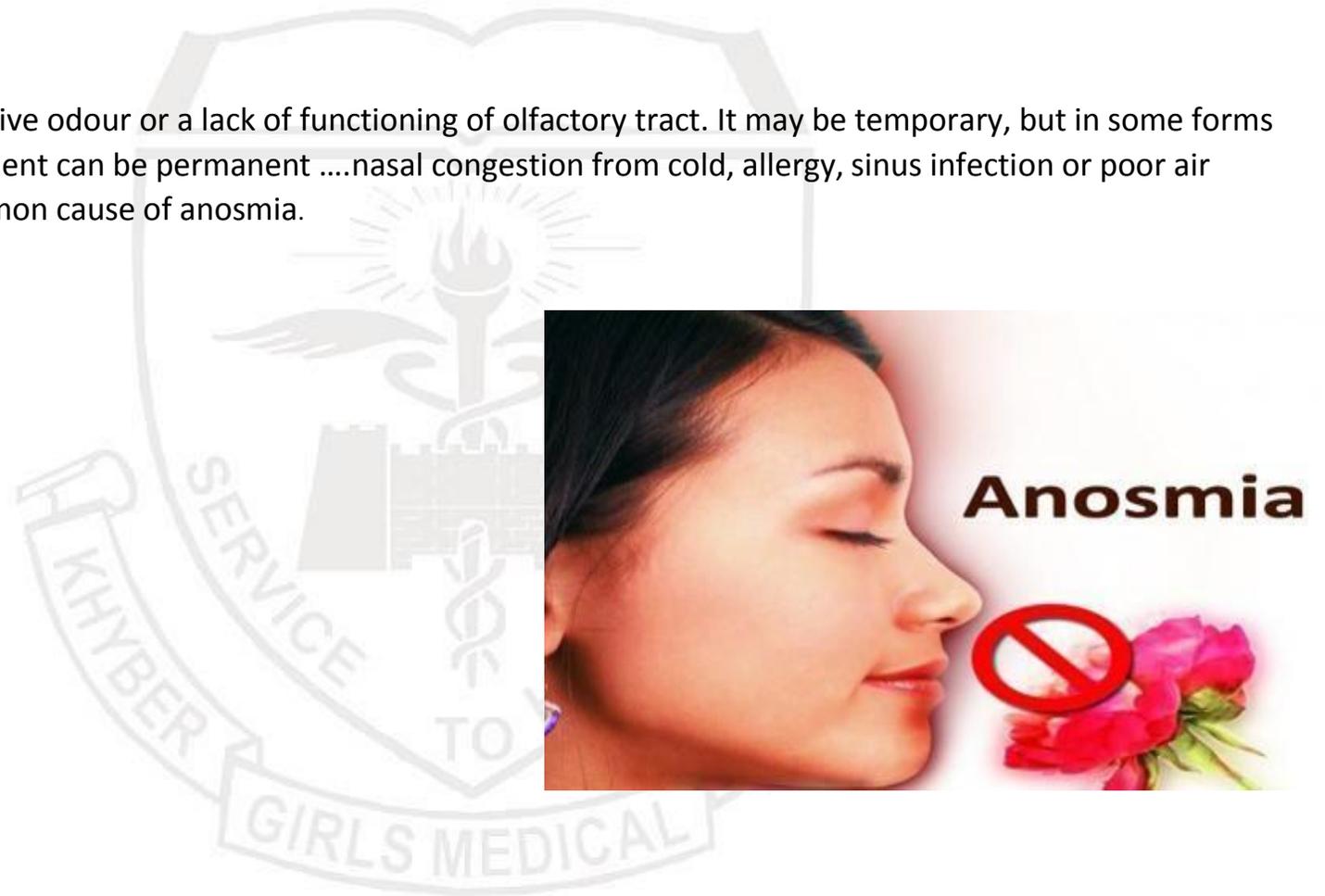
	Discuss the arterial supply and innervation of the pharyngeal arches	LGF	MCQ,OSPE
	Describe the pharyngeal membranes	LGF	MCQ,OSPE
	Discuss the branchial cyst, sinuses, and fistula	LGF	MCQ,OSPE
	Describe the 1 st arch developmental defects	LGF	MCQ,OSPE
Histology			
Thyroid gland	Discuss the structural unit of thyroid gland	LGF	MCQ,OSPE
	Identify the lining epithelium of follicular cells	LGF	MCQ,OSPE
	Discuss the formation and storage of colloid in the lumen of follicular cells	LGF	MCQ,OSPE
	Describe the location and structure of parafollicular cells	LGF	MCQ,OSPE
	Discuss the interfollicular connective tissue	LGF	MCQ,OSPE
ENT			
Lump in neck	Approach to a patient with lump in the neck	LGF	MCQ,OSPE
Skills and affective domain			
Histology			

Thyroid gland	Identify the slide of thyroid gland under the microscope	PRACTICAL/DEMO	MCQ/OSPE
Physiology			
Examination of Eye	Examine a standardized patient for visual acuity and errors of refraction.	PRACTICAL/DEMO	MCQ/OSPE
Perimetry	Examine the patient for visual field function	PRACTICAL/DEMO	MCQ/OSPE

Theme 3

ANOSMIA

It's the inability to perceive odour or a lack of functioning of olfactory tract. It may be temporary, but in some forms such as those from accident can be permanentnasal congestion from cold, allergy, sinus infection or poor air quality is the most common cause of anosmia.



Topic	Learning Objectives	Teaching strategy	Assessment
Gross Anatomy			
Nose and paranasal sinuses	Describe the external features of nose	DISSECTION/SGD	MCQ,OSPE
	Describe the relations of nose with other structures	DISSECTION/SGD	MCQ,OSPE
	Describe the nasal septum	DISSECTION/SGD	MCQ,OSPE
	Describe the lateral wall of nose	DISSECTION/SGD	MCQ,OSPE
	Name the neurovascular supply of nose	DISSECTION/SGD	MCQ,OSPE
	Describe the olfactory nerve	DISSECTION/SGD	MCQ,OSPE
	Describe the paranasal sinuses along with its clinical importance	DISSECTION/SGD	MCQ,OSPE
Embryology			
Development of nose	Describe the development of nasal cavities and paranasal air sinuses.	LGF	MCQ
	Describe the development of nasolacrimal groove, duct, and sac	LGF	MCQ
	Enlist developmental defects of nose	LGF	MCQ

Physiology			
Sense of Smell	Describe olfactory membrane	LGF	MCQ
	Explain mechanism of excitation of the olfactory cells.	LGF	MCQ
	Discuss Rapid Adaptation of Olfactory Sensations.	LGF	MCQ
	Define threshold for smell	LGF	MCQ
	Describe transmission of smell signals into the central nervous system	LGF	MCQ
	Describe primitive and newer olfactory pathways into the central nervous system	LGF	MCQ
	Describe centrifugal control of activity in the olfactory bulb by the central nervous system.	LGF	MCQ
ENT			
Sinusitis	Describe the causes and clinical features of acute and chronic sinusitis	LGF	MCQ
GROSS ANATOMY			
Tongue	Describe the mucosa and muscles of tongue along with its attachments, nerve supply and actions	LGF	MCQ
Salivary glands	Name the salivary glands	LGF	MCQ
	Describe the location of each gland	LGF	MCQ
	Describe the relations of each gland	LGF	MCQ
	Name the nerve supply	LGF	MCQ

	Describe the drainage of salivary glands along with its importance	LGF	MCQ
Palate	Name the bones forming the hard palate	DISSECTION/DEMO	MCQ
	Describe the soft palate along with its muscles, attachments and nerve supply	DISSECTION/DEMO	MCQ
	Describe the relations of palate	DISSECTION/DEMO	MCQ
	Name the neurovascular supply of palate	DISSECTION/SGD	MCQ
Pharynx	Enumerate the division of pharynx	DISSECTION/SGD	MCQ
	Describe the nasopharynx with its clinical significance	DISSECTION/SGD	MCQ
	Describe the oropharynx with its clinical significance	DISSECTION/SGD	MCQ
	Describe the laryngopharynx with its clinical significance	DISSECTION/SGD	MCQ
	Enlist the muscles of pharynx with its nerve supply and actions	DISSECTION/SGD	MCQ
Extra-cranial course of CN	Describe the extra cranial course of CN IX, X, XI and XII	DISSECTION/SGD	MCQ
Embryology			
Tongue	Describe the development of anterior 2/3 of the tongue	LGF	MCQ
	Discuss the role of the third pharyngeal arch in tongue development.	LGF	MCQ
	Discuss the innervation, blood vessels, and muscles of tongue.	LGF	MCQ
	Describe the development of papillae, taste buds and salivary glands.	LGF	MCQ
	Describe the developmental anomalies of tongue.	LGF	MCQ

Palate	Describe the development of primary and secondary palate.	LGF	MCQ
	Discuss the developmental defects of lip and primary, secondary palate	LGF	MCQ
Histology			
Submandibular glands	Identify the variety of gland according to nature of its acinus.	LGF	MCQ
	Discuss the capsular structure and its extensions in the gland	LGF	MCQ
	Differentiate between the stroma and parenchyma of submandibular gland	LGF	MCQ
	Describe the ductal system of the gland and its differences with parotid gland	LGF	MCQ
	Describe the detailed structure of serous and mucous acinus	LGF	MCQ
	Discuss the formation of serous demilune	LGF	MCQ
	Discuss the opening of Wharton,s duct	LGF	MCQ
	Discuss different pathological conditions of the gland	LGF	MCQ
Sublingual glands	Identify the variety of gland according to its nature of acinus	LGF	MCQ
	Differentiate between the stroma and parenchyma of sublingual gland	LGF	MCQ
	Describe the ductal system of the gland and its lining epithelium	LGF	MCQ
	Describe the detailed structure of its acinus	LGF	MCQ
	Discuss the opening of Bartholin ducts	LGF	MCQ
	Discuss different pathological conditions of the gland	LGF	MCQ

Physiology			
Sense of Taste	Discuss primary sensations of taste	LGF	MCQ
	Explain threshold for taste	LGF	MCQ
	Describe the taste bud and its function	LGF	MCQ
	Describe mechanism of stimulation of taste buds	LGF	MCQ
	Describe transmission of taste signals into the central nervous system	LGF	
Pediatric Surgery			
Cleft palate	Describe the pathogenesis, clinical features and management of a patient with cleft palate	LGF	MCQ
Skill and Affective Domain			
Histology			
Tongue	Identify the slide of tongue under the microscope	PRACTICAL/DEMO	MCQ
Physiology			
Examination of Cranial nerves iii,iv,vi	Examination of colour vision of patient Examination of fundus with ophthalmoscope	PRACTICAL/DEMO	MCQ

Theme4

Diplopia

Double vision also called diplopia, causes a person to see two images of a single object. There are two types of double vision monocular and binocular vision, there are different tests to determine the real cause of double vision

- Monocular vision: is double vision in only one eye, the double vision continues even when the other eye is covered.
- Binocular vision: is double vision related to misalignment of the eyes. The double vision stops if either of the eye is covered, then there are problems in extraocular muscles.



Specific Learning Objectives:

Topic	Learning objectives	Teaching strategy	Assessment
Gross Anatomy			
Bony orbit	Name the bones forming the bony orbit	DISSECTION/SGD	MCQ,OSPE
	Identify the foramina, fissures, and fossae associated with the orbit and what are the structures transmitted through these openings.	DISSECTION/SGD	MCQ,OSPE
	Name the contents of orbit	DISSECTION/SGD	MCQ,OSPE
Eye ball	Name the layers of eyeball	DISSECTION/SGD	MCQ,OSPE
	Describe the fibrous layer of eyeball	DISSECTION/SGD	MCQ,OSPE
	Describe the pigmented layers of eyeball	DISSECTION/SGD	MCQ,OSPE
	Describe the inner nervous layer of eyeball	DISSECTION/SGD	MCQ,OSPE
	Describe the chambers and of eyeball	DISSECTION/SGD	MCQ,OSPE
	Describe the secretion and drainage of aqueous humor and vitrous humor	DISSECTION/SGD	MCQ,OSPE
	Describe the neurovascular supply of eye	DISSECTION/SGD	MCQ
	Describe the intra and extraoccular muscles with their attachment, actions and nerve supply	DISSECTION/SGD	MCQ

Extra cranial course of CN III, IV, VI	Describe the course of optic, oculomotor, trochlear and abducent nerve with clinical importance	DISSECTION/SGD	MCQ
Embryology			
Development of eye	Define lens placode and formation of retina.	LGF	MCQ
	Describe the development of ciliary body, iris, lens and choroid.	LGF	MCQ
	Discuss the formation of sclera, cornea, sphincter and dilator pupillae	LGF	MCQ
	Discuss the development of vitreous body and optic nerve	LGF	MCQ
	Describe developmental anomalies of eye	LGF	MCQ
Histology			
Eye	Enlist different histological layers of the eye	LGF	MCQ
	Discuss retinal pigment epithelium(RPE) in detail	LGF	MCQ
	Describe the structural details of rods	LGF	MCQ
	and cones and the supporting cells	LGF	MCQ
	Discuss structure of macula densa	LGF	MCQ
	Describe the histological layers of cornea and retina	LGF	MCQ

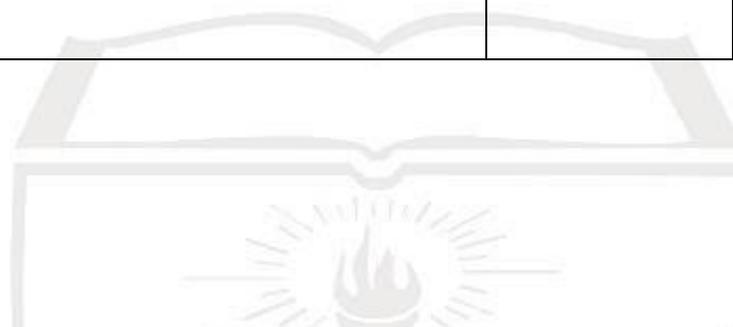
Physiology

Physical Principles of Optics	Describe refraction at interface between two media.	LGF	MCQ
	Describe the physical principles of optics.	LGF	MCQ
	Apply refractive principles to lenses	LGF	MCQ
	Describe Focal Length of a Lens	LGF	MCQ
	Explain formation of image by convex lenses	LGF	MCQ
Optics of The Eye	Explain lens system of the eye.	LGF	MCQ
	Describe the concept of “Reduced” Eye.	LGF	MCQ
	Explain accommodation reflex.	LGF	MCQ
	Explain presbyopia	LGF	MCQ
	Describe that “depth of focus” of the lens system increases with decreasing pupillary diameter	LGF	MCQ
	Define visual acuity.	LGF	MCQ
	Explain the determination of distance of an object from the eye- — “DEPTH PERCEPTION”	LGF	MCQ
	Describe errors of refraction	LGF	MCQ
Fluid System of The Eye— Intraocular Fluid	Describe the formation of aqueous humor by the ciliary body	LGF	MCQ

	Describe the outflow of aqueous humor from the eye	LGF	MCQ
	Describe Regulation of Intraocular Pressure and Glaucoma	LGF	MCQ
Anatomy and Function of The Structural Elements of The Retina	Describe foveal region of the retina and its importance in acute vision.	LGF	MCQ
	Discuss the functional parts of the Rods and Cones.	LGF	MCQ
	Describe blood supply of the retina—the central retinal artery and the choroid	LGF	MCQ
Photochemistry of Vision	Explain rhodopsin-retinal visual cycle and excitation of the rods	LGF	MCQ
	Explain the role of vitamin A for formation of rhodopsin.	LGF	MCQ
	Describe excitation of the rod when rhodopsin is activated by light	LGF	MCQ
	Describe receptor potential, and logarithmic relation of the receptor potential to light intensity	LGF	MCQ
	Describe mechanism by which rhodopsin decomposition decreases membrane sodium conductance—the excitation “cascade.”	LGF	MCQ
	Explain dark and light adaptation.	LGF	MCQ
Color Vision	Describe photochemistry of color vision by the cones	LGF	MCQ
	Explain tricolor mechanism of color detection	LGF	MCQ
	Explain Young-Helmholtz theory of color vision.	LGF	MCQ
	Explain color blindness.	LGF	MCQ

Neural Function of The Retina	Describe different neuronal cell types and their functions	LGF	MCQ
	Describe the visual pathway from the cones to the ganglion cells	LGF	MCQ
	Discuss the retinal neurotransmitters.	LGF	MCQ
	Discuss retinal ganglion cells and their respective fields	LGF	MCQ
	Describe lateral inhibition.	LGF	MCQ
	Explain excitation of ganglion cells.	LGF	MCQ
	Discuss on and off response of ganglion cells.	LGF	MCQ
Visual Pathways	Discuss the function of the dorsal lateral geniculate nucleus of the thalamus.	LGF	MCQ
	Describe organization and function of the visual cortex	LGF	MCQ
	Describe primary visual cortex.	LGF	MCQ
	Describe secondary visual areas of the cortex.	LGF	MCQ
	Describe two major pathways for analysis of visual information: (1) the fast “position” and “motion” pathway and (2) the accurate color pathway	LGF	MCQ
	Describe neuronal patterns of stimulation during analysis of the visual image	LGF	MCQ
	Discuss detection of color	LGF	MCQ

Eye Movements and Their Control	Describe muscular control of eye movements.	LGF	MCQ
	Describe neural pathways for control of eye movements.	LGF	MCQ
	Describe fixation movements of the eyes	LGF	MCQ
	Explain mechanism of involuntary locking fixation—role of the superior colliculi.	LGF	MCQ
	Explain “Fusion” of the visual images from the two eyes	LGF	MCQ
	Describe neural mechanism of stereopsis for judging distances of visual objects	LGF	MCQ
Autonomic control of Accommodation and pupillary aperture	Describe autonomic nerves to the eyes	LGF	MCQ
	Describe control of accommodation	LGF	MCQ
	Describe control of pupillary diameter	LGF	MCQ
	Discuss Pupillary reflexes or reactions in central nervous system disease.	LGF	MCQ
Community Medicine			
Prevention of blindness	Describe the causative agents and prevention of community blindness	LGF	MCQ



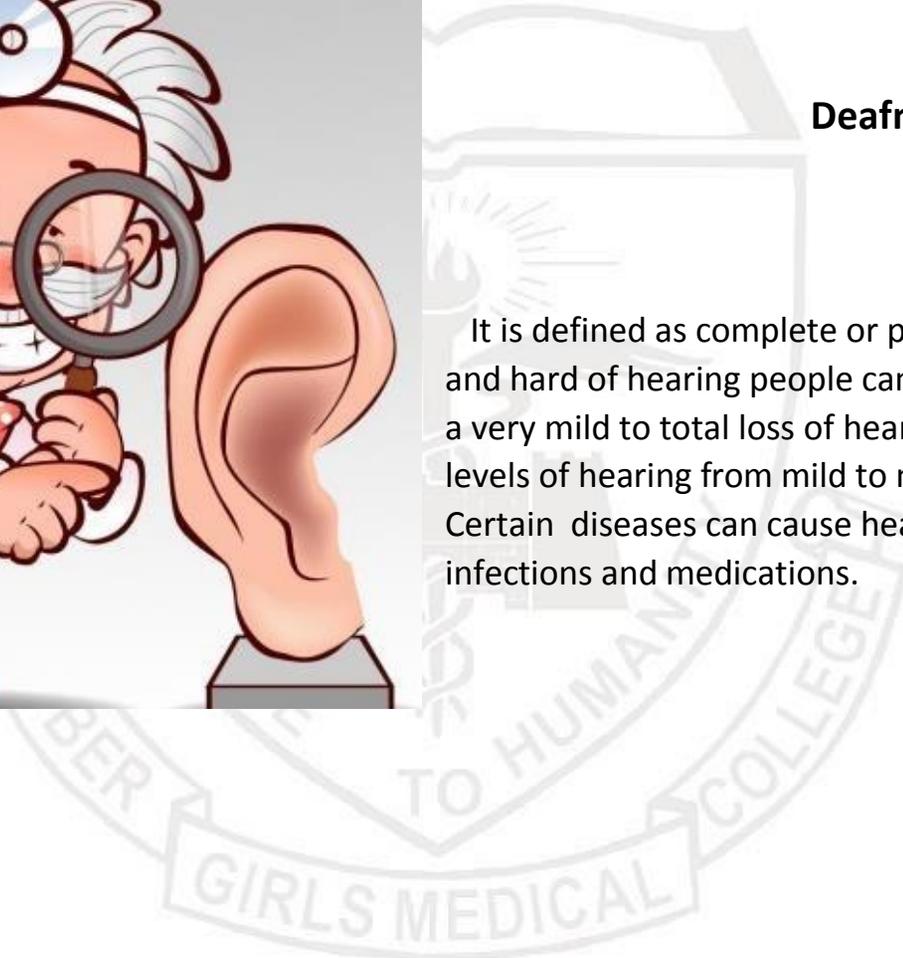
Medicine			
Ocular nerves palsies	Describe the clinical features and etiology of 3, 4 and 6 th nerve palsies	LGF	MCQ
Ophthalmology			
blindness	Approach a patient with unilateral and bilateral blindness	LGF	MCQ
Skills and affective domain			
Histology			
Parotid Gland	Identify the histological layers of parotid gland under the microscope	PRACTICAL/DEMO	MCQ
Physiology			
Tuning fork tests	Examine a standardized patient for hearing loss with tuning fork (Weber and Rinne`s test)	PRACTICAL/DEMO	MCQ,OSPE



Theme 5

Deafness

It is defined as complete or partial hearing loss. Deaf and hard of hearing people can experience anything from a very mild to total loss of hearing. There are different levels of hearing from mild to moderate to severe. Certain diseases can cause hearing loss including infections and medications.



Topic	Learning objectives	MIT	Assessment strategy
Gross Anatomy			
External and middle ear	Describe the auricle	DISSECTION/SGD	MCQ, OSPE
	Describe the external auditory meatus with clinical importance	DISSECTION/SGD	MCQ, OSPE
	Name the neurovascular supply of external ear	DISSECTION/SGD	MCQ, OSPE
	Name the boundaries of middle ear	DISSECTION/SGD	MCQ, OSPE
	Describe the contents of middle ear	DISSECTION/SGD	MCQ, OSPE
	Describe the auditory tube along with its clinical importance	DISSECTION/SGD	MCQ, OSPE
Inner ear	Describe the bony labyrinth	DISSECTION/SGD	MCQ, OSPE
	Describe the membranous labyrinth	DISSECTION/SGD	MCQ, OSPE
	Describe the course of CN VIII along with its clinical importance	DISSECTION/SGD	MCQ, OSPE
Embryology			
Development of ears	Describe the development of external and middle ear	LGF	MCQ
	Explain the origin of internal ear along the relationship of saccule, utricle, semi-circular canals	LGF	MCQ
	Describe the development of cochlear duct and organ of corti	LGF	MCQ
	Enlist the developmental anomalies of external middle and internal ear	LGF	MCQ
Physiology			

Tympanic Membrane and The Ossicular system	Explain conduction of sound from the tympanic membrane to the cochlea.	LGF	MCQ,
	Describe "Impedance Matching" by the Ossicular System.	LGF	MCQ
	Describe attenuation of sound by contraction of the tensor tympani and stapedius muscles.	LGF	MCQ
	Describe transmission of sound through bone.	LGF	MCQ,
Cochlea	Describe functional anatomy of the cochlea	LGF	MCQ
	Describe basilar membrane and resonance in the cochlea.	LGF	MCQ
	Describe transmission of sound waves in the cochlea—"traveling wave"	LGF	MCQ,
	Describe pattern of vibration of the basilar membrane for different sound frequencies.	LGF	MCQ
	Describe amplitude pattern of vibration of the basilar membrane.	LGF	MCQ
	Describe function of the organ of corti	LGF	MCQ,
	Describe Excitation of the Hair Cells	LGF	MCQ
	Discuss the "place" principle	LGF	MCQ
	Describe detection of changes in loudness—the power law.	LGF	MCQ,
	Describe threshold for hearing sound at different frequencies.	LGF	MCQ
Auditory Nervous Pathways	Describe auditory pathway.	LGF	MCQ
	Explain the function of the cerebral cortex in hearing.	LGF	MCQ,

	Describe how to determine the direction from which sounds come.	LGF	MCQ
	Describe transmission of centrifugal signals from CNS to lower auditory centres	LGF	MCQ
	Describe different types of deafness.	LGF	MCQ,
Vestibular Sensations and Maintenance of Equilibrium	Describe the physiologic anatomy of vestibular apparatus	LGF	MCQ
	Describe function of the utricle and saccule in the maintenance of static equilibrium	LGF	MCQ
	Describe function of semi-circular ducts	LGF	MCQ,
	Describe Neuronal Connections of the Vestibular Apparatus	LGF	MCQ
	Describe Vestibular mechanism for stabilizing the eyes	LGF	MCQ
ENT			
Hearing loss	Describe different clinical tests for hearing loss	LGF	MCQ,
	Describe the etiology and management of conduction and sensorineural hearing loss	LGF	MCQ
Skills and Affective Domain			
Physiology			
Audiometry	Examine a standardized patient for functions of inner ear	PRACTICAL/DEMO	MCQ,OSPE

Teaching and learning strategies:

The following teaching / learning methods are used to promote better understanding:

- Interactive Lectures
- Hospital / Clinic visits
- Small Group Discussion
- Skills session
- Self-Directed Study

Interactive lectures:

An interactive lecture is an easy way for instructors to intellectually engage and involve students as active participants in a lecture-based class of any size. Interactive lectures are classes in which the instructor breaks the lecture at least once per class to have students participate in an activity that lets them work directly with the material.

- The instructor might begin the interactive segment with an engagement trigger that captures and maintains student attention.
- Then the instructor incorporates an activity that allows students to apply what they have learned or give them a context for upcoming lecture material.

- As the instructor feels more comfortable using interactive techniques he or she might begin to call upon a blend of various interactive techniques all in one class period.

Hospital / Clinic visits:

In small groups, students observe patients with signs and symptoms in hospital or clinical settings. This helps students to relate knowledge of basic and clinical sciences of the relevant module.

Small group discussion (SGD):

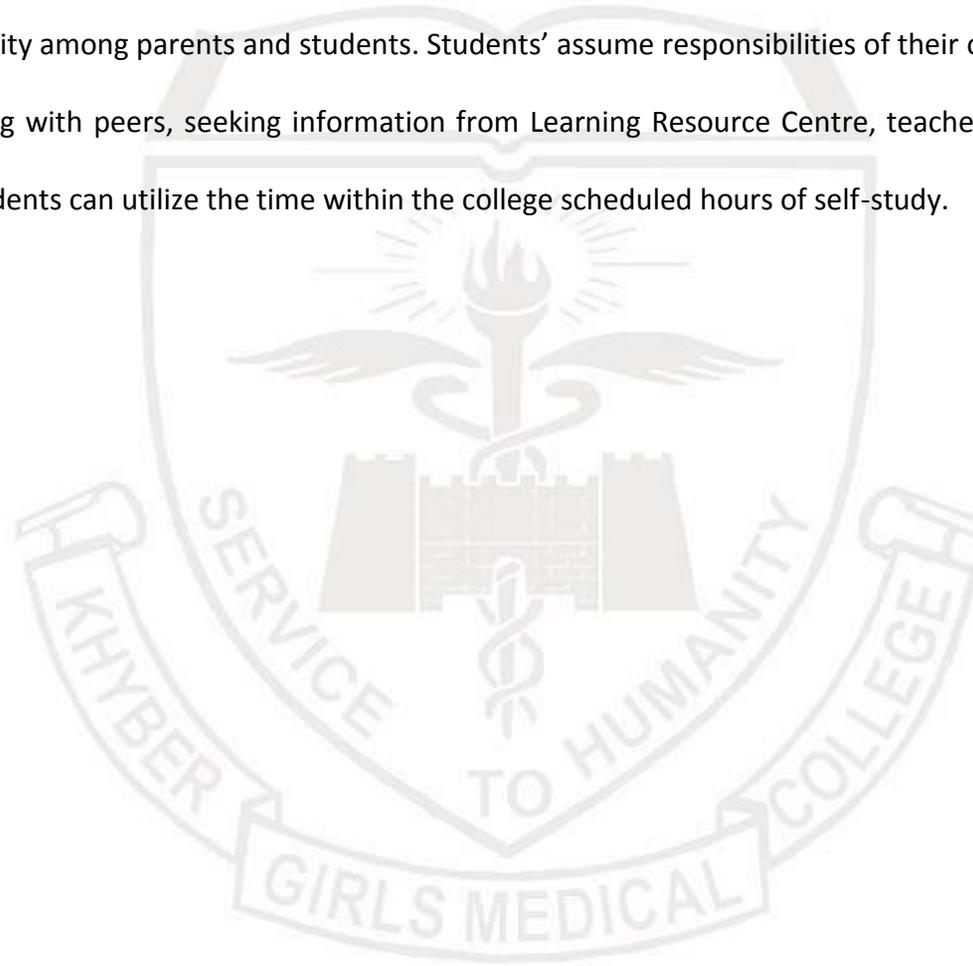
The shy and less articulate are more able to contribute. Students learn from each other. Everyone gets more practice at expressing their ideas. A two way discussion is almost always more creative than individual thoughts. Social skills are practiced in a 'safe' environment e.g. tolerance, cooperation. This format helps students to clarify concepts acquire skills or attitudes. Students exchange opinions and apply knowledge gained from lectures, tutorials and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

Skills/Practical session:

Skills relevant to respective module are observed and practiced where applicable in skills laboratory or Laboratories of various departments.

Self-Directed learning (SDL):

Self-directed learning, which involves studying without direct supervision in a classroom/Library, is a valuable way to learn and is quickly growing in popularity among parents and students. Students' assume responsibilities of their own learning through individual study, sharing and discussing with peers, seeking information from Learning Resource Centre, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self-study.



Time tables:

The timetables for the module will be shared via Ed modo and the notice boards in advance.

Assessment tools:

Theoretical knowledge is tested by a written examination system constituted by multiple choice questions (MCQs). The assessment of practical knowledge involves oral, spot, or objective structured practical examinations (OSPE).

Multiple Choice Questions (MCQs):

- Multiple choice questions (MCQs) are a form of assessment for which students are asked to select the best choice from a list of answers.
- MCQ consists of a stem and a set of options. The stem is usually the first part of the assessment that presents the question as a problem to be solved; the question can be an incomplete statement which requires to be completed and can include a graph, a picture or any other relevant information. The options are the possible answers that the student can choose from, with the correct answer called the key and the incorrect answers called distractors.
- Correct answer carries one mark, and incorrect 'zero mark'. There is NO negative marking.
- Students mark their responses on specified computer-based sheet designed for the college.
- The block exam will comprise of 120 MCQs and will be compiled according to the shared blueprint.

Objective Structured Practical Examination (OSPE):

- The content may assess application of knowledge, or practical skills.
- Student will complete task in define time at one given station.
- All the students are assessed on the same content by the same examiner in the same allocated time.
- A structured examination will have observed, unobserved, interactive and rest stations.
- Observed and interactive stations will be assessed by internal or external examiners.
- Unobserved will be static stations in which students will have to answer the questions related to the given pictures, models or specimens the provided response sheet.
- Rest station is a station where there is no task given, and in this time student can organize his/her thoughts.
- The Block OSPE will be comprise of 18 examined station and 7 rest stations. The stations will be assigned according to the shred blueprint.

Internal Evaluation:

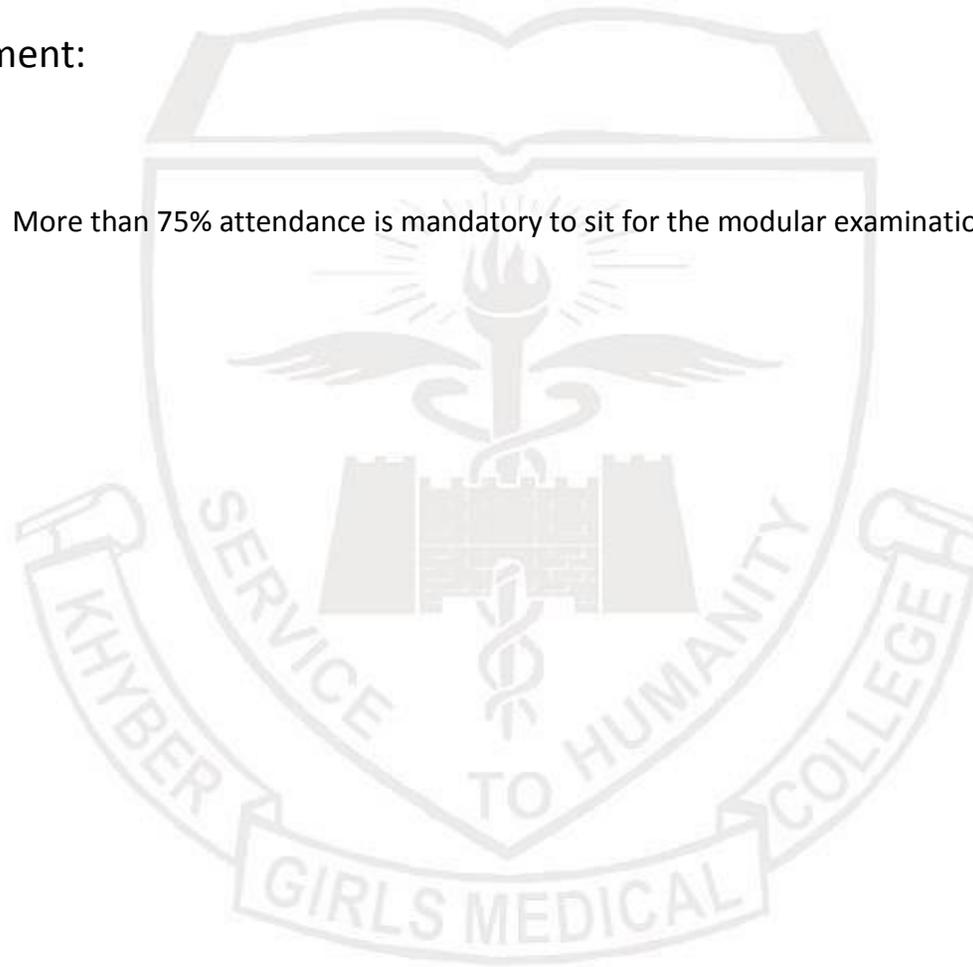
Internal evaluation is a process of quality review undertaken within an institution for its own ends. 10% marks of internal evaluation will be added to final marks. This 10% will be based on

Distribution of 14 Marks for paper	
Marks obtained	Average of Percentage in Block exam and Pre Professional exam.

Distribution of 10 Marks for Block A OSPE/OSPE	
Marks obtained	Average of percentage in Block OSPE Exam and Block Pre Prof OSPE
	Practical copies

Attendance Requirement:

More than 75% attendance is mandatory to sit for the modular examinations.



Learning Resources

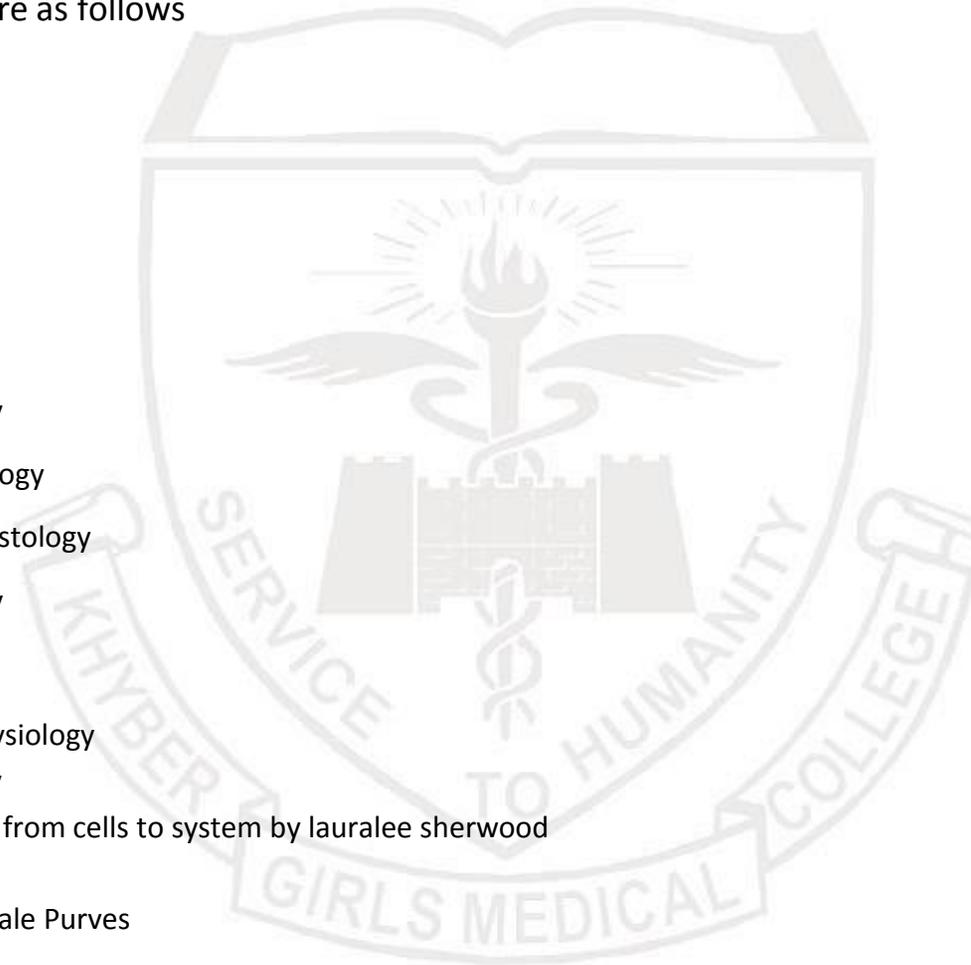
The learning resources are as follows

Anatomy

- Snell Neuroanatomy
- B.D Churasia
- Nelter Atlas
- Langman embryology
- Keithalmore embryology
- Laiq Hassain Basic Histology
- Difore Atlas Histology

Physiology

- Guyton nd Hall physiology
- Ganong physiology
- Human Physiology from cells to system by lauralee sherwood
- BRS Physiology
- Neuroscience by Dale Purves



Biochemistry

- Chatterjee text book of Biochemistry
- Harpers Biochemistry
- Lippincotts Biochemistry
- Satya Narayan biochemistry

Apart from these resources learning, students can consult books available in library or recommended by the specialty experts.

