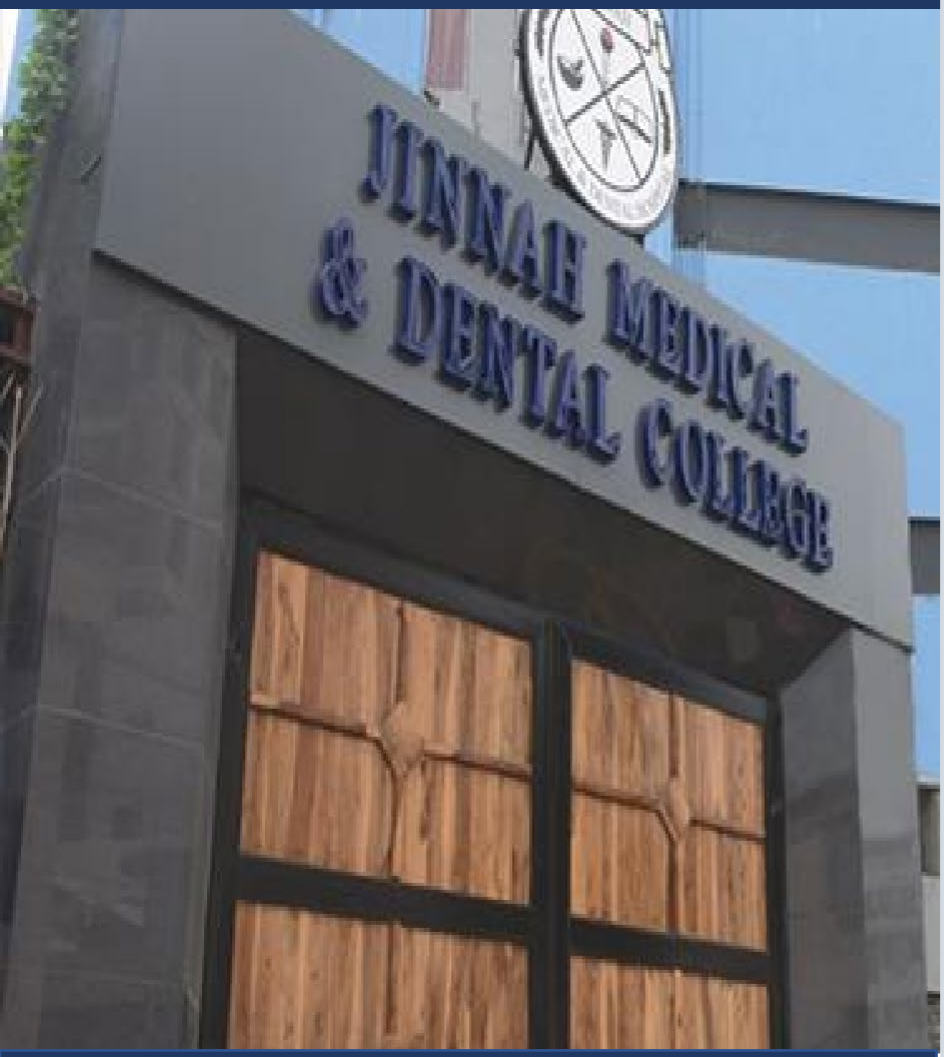

PHYSIOLOGY

GUIDE BOOK

Academic year: 2022-23

Authored by:
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VISION

To set local and global standards for quality patient outcomes- creating a culture of excellence to promote a transformative experience for the 21st century clinicians, educators and researchers to benefit all humanity.

MISSION

We are committed to develop well rounded academics, thinkers, clinicians and researchers by strengthening a global view, broadening intellectual foundation and teaching effective communication. It is our aspiration to cultivate creative and critical thinking skills for problem solving, sensitive to cultural and ethical values and responsibilities. Our graduates will be role models and leaders for society.

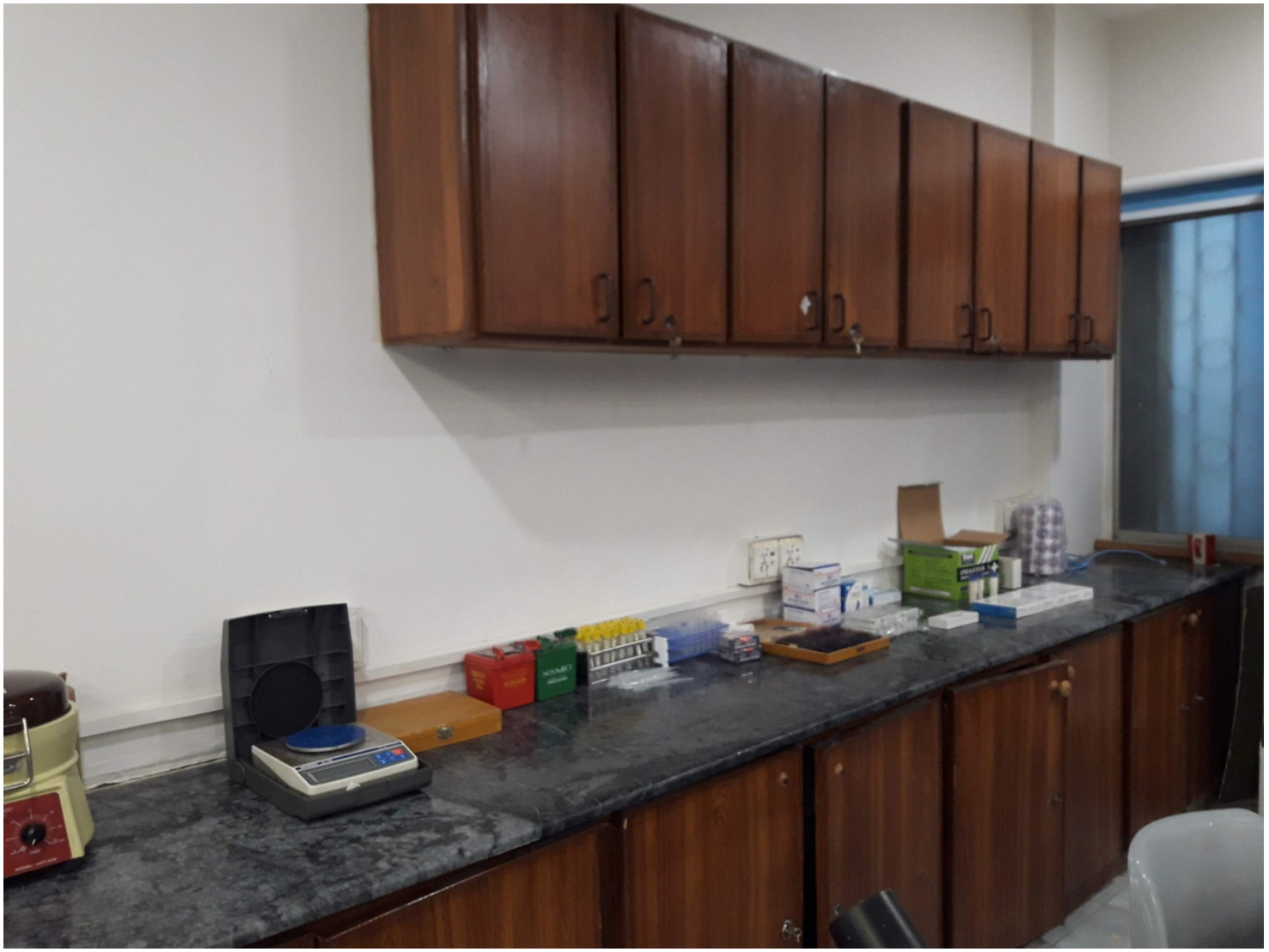
VALUES

- Equity
- Quality
- Compassionate behaviour
- Social accountability
- Social justice
- Humanistic approach
- Leadership
- Innovation
- Integrity
- Collaboration

PROGRAM LEARNING OUTCOMES – 7 STAR DOCTOR - (PMDC)

Our dental graduate shall be able to:

- Develop insight, imagination and curiosity, define one's unique self, one's values and one's place in the world, while incorporating the qualities of a good physician.
- Answer complex questions facing physicians, including the role they should play in society, politics, and promotion of social justice.
- Display enlightenment and moral values to prepare themselves for life and work in a problematic, changing and diverse world.
- Be responsible leaders for their own good of their family, community and country.
- Be humane and socially equipped individuals, in tune with rights of patients and vulnerable groups
- Develop moral reasoning for ethical dilemmas
- Be experts of critical situational analysis
- Believe in diversity in practice
- Display effective communication
- Be able to address population health system issues on the basis of demography, by statistics, epidemiology and cultural nuances.



PHYSIOLOGY - COURSE CODE - 1.2

INTRODUCTION

Physiology is one of the basic science disciplines taught at undergraduate level in traditional & integrated curriculum, in medical, dental and other health professional education. Physiology teaching makes students understand and comprehend the normal functions and mechanisms of the human body. Its importance lies in its application in clinical practice. The close association of physiology with clinical medicine is highlighted in the preclinical years, and also in hospital practice later. Good understanding of physiological concepts helps in studying pathology and medicine.

HIERARCHY OF THE DEPARTMENT

Faculty of Basic Health Sciences

Department of Physiology Organogram

JMDC

Dr.Sadaf Fatima Naqvi

MBBS, M Phil, MCPS HPE

HOD

Dr. Alina Atif
MBBS, M Phil
Associate Professor

Dr. Sassi Kanwal
MBBS, M Phil
Assistant Professor

Dr. Sara Rafique
BDS, M Phil
Assistant Professor

Dr. Mohd Sultan
BDS
Lecturer

Dr. Kiran Zehra
BDS
Lecturer

Dr. Areej Qamar
MBBS
Lecturer

Dr. Anushay Nadeem
MBBS
Lecturer

Mr. Sami
Laboratory Assistant

TEACHING AND LEARNING STRATEGIES

Lectures (large group teaching)

First year BDS students are taught Physiology in the lectures and this is complemented with Practical teaching in the physiology lab for a better understanding.

For Physiology teaching, there are 3 lectures per week; each of 50 minutes duration.

For student engagement and active participation to its fullest, following are employed:

a. Quizzes

b. Active learning strategies.

Learning guidance:

To complement the lectures, students are provided with videos, relevant book chapters and materials for better understanding.

Along with these individual and group tasks are assigned.

E-Learning:

In the challenging times of pandemic COVID-19, distance learning has been incorporated in the strategies of learning and teaching.

An easy access has been provided to the students through the institution's E-portal.

Each student has the access to the portal through their individual Ids, on which they can go through the recorded lectures and material, whenever they want.

During the pandemic, and now as a routine, students can access their recorded lectures of Operative Dentistry on Google classroom as well. The same is used to share videos of clinical procedures; and share and receive assignments with students.

Zoom is also utilized to deliver the lectures in real time during the lockdown.

ASSESSMENT TOOLS AND STRATEGIES:

In-Class Assessment:

a. Participation/ interaction

b. Quizzes.

c. Assignments.

Assessment:

An unobserved and observed OSPE is conducted in the lab at the end of each topic to assess the learning of students. This is to ensure that the students develop the required skills under supervision in a controlled environment.

Mid Term examinations:

These are conducted in the mid of the academic year. It has the following components:

Component	**Marks**
BCQs	100
OSPE	60
VIVA	40
TOTAL	**200**

Pre-Professional examinations:

These are conducted at the end of the academic year before the final professional examination. The break-up is as follows:

Component	**Marks**
BCQs	100
OSPE	60
VIVA	40
TOTAL	**200**

INTERNAL EVALUATION/ CONTINUOUS ASSESSMENT POLICY:

Continuous Assessment

Continuous Assessment Policy		
1.	Assignment/ class test/ ward test etc.	25%
2.	Mid-term exam	35%
3.	Pre-prof. exam	35%
4.	Extra effort	5%

Details of Assignments/ Test/Mid-term/ Pre-professional examinations.		
	Present and fail	25%
	Pass	Actual percentage
	ABSENT	**ZERO**

Professional Annual Examinations:

Professional annual examinations are conducted by the University (JSMU) and comprise theory examinations and OSPE/OSCE.

Eligibility criteria for sitting in the Professional Annual Examination are as follows:

1. Minimum of **40% aggregate** marks in all continuous assessment examinations (Mid-Term Examinations, Pre-Professional Examinations, Assignments and Tests)
2. Students less than **75% overall attendance** will not be allowed to sit in the Annual Professional Examinations.
3. Clinical attendance will be maintained separately. Attendance in any clinical rotation which falls below **75%** must be made up by students.
4. Students must obtain **passing marks in the clinical ward tests**. Failing to do so, students will have to sit for re-take ward test (Only one re-take is allowed).

To be considered successful in annual professional examination the students must pass individual components of the professional examination.

This is to say, that the students must pass theory and OSPE/ OSCE examinations independent of each other. Failing one component will result in failing that component of the subject only. The student will then have to appear for supplementary examinations in that component of the subject.

Physiology Curriculum:

1.2.1 FOUNDATION:

S.NO.	TOPICS	LEARNING OBJECTIVES By the end of first year BDS, the student should be able to	LEARNING STRATEGIES	ASSESSMENT TOOLS The students will be assessed during class tests, mid-rotation and end-of rotation tests; mid-term and final examination through:
1.	Homeostasis	1. Discuss • Importance of Physiology in modern medicine • Basic life processes and survival needs of the body. • Principle of homeostasis as a central theme of Physiology • Negative and positive feedback systems.	1. Lecture 2. Tutorial	BCQs
2.	Body fluid compartments	1. Describe the body fluid compartments 2. Discuss the composition of body fluid compartments	1. Lecture 2. Tutorial	BCQs
3.	Cell membrane	1. Define cell 2. Discuss the importance of cell as the basic unit of life 3. Describe the composition of cell membrane 4. Discuss the structure and	1. Lecture 2. Tutorial	BCQs OSPE

		functions of components of cell.		
4.	Membrane transport	1. Define the following: • osmotic pressure • tonicity • bulk transport • phagocytosis • pinocytosis 2. Discuss the types of membrane transport 3. Compare types of solutions with regard to their tonicity	1. Lecture /Practical 2. Tutorial	BCQs OSPE

1.2.2 NERVE AND MUSCLE:

S.NO.	TOPICS	TOPIC OBJECTIVES	LEARNING STRATEGIES	ASSESSMENT TOOLS
1.	Resting membrane potential	1. Discuss • Distribution of ions across the plasma • Resting potential & its importance 2. Define Nernst potential 3. Write the Nernst equation	1. Lecture 2. Tutorial	BCQs
2.	Structure of neuron & synapse	1. Describe the structure & function of different parts of neuron 2. Define synapse 3. Discuss the following types of synapse • Electrical • chemical	1. Lecture 2. Tutorial	BCQs
3.	Graded potential	1. Discuss graded potential	1. Lecture 2. Tutorial	BCQs
4.	Action potential, its properties and propagation	1. Discuss the action potential, its propagation in myelinated and non myelinated nerve fibers. 2. Describe the graph of action potential 3. Differentiate between graded and action potentials	1. Lecture 2. Tutorial	BCQs OSPE
5.	Structure of skeletal muscle	1. Describe muscle tissue and its functions.	1. Lecture 2. Tutorial	OSPE

		2. Discuss organizational level of skeletal muscle		
6.	Neuromuscular junction	1. Discuss the parts of neuromuscular junction (NMJ) 2. Discuss the steps of impulse transmission through neuromuscular junction 3. Discuss the physiological basis of disorders of NMJ	1. Lecture 2. Tutorial	BCQs OSPE
7.	Excitation contraction coupling	1. Discuss muscle contraction in skeletal muscle 2. Describe structure and function of sarcoplasmic reticulum and T tubules	1. Lecture 2. Tutorial	BCQs OSPE
8.	Skeletal muscle contraction	1. Define power stroke. 2. Discuss mechanism of skeletal muscle contraction and relaxation at molecular level 3. Describe the role of ATP in muscle contraction	1. Lecture 2. Tutorial	BCQs
9.	Skeletal muscle mechanics	1. Define • Motor unit • Motor unit recruitment • Simple muscle twitch • Summation • Tetanization • Fatigue 2. Differentiate between isotonic and isometric muscle contraction	1. Lecture/Practical 2. Tutorial	BCQs OSPE
10.	Energetic of skeletal muscle	1. List the sources of energy for muscle contraction 2. Explain the basis of muscle fatigue 3. Differentiate among the types of muscle fibers on the basis of structure and function	1. Lecture 2. Tutorial	BCQs
11.	Smooth muscle	1. List the types of smooth muscles 2. Discuss the following: 3. Membrane & action potentials in smooth muscles 4. Contractile mechanism of	1. Lecture 2. Tutorial	BCQs OSPE

		smooth muscle 5. Nervous and hormonal control of smooth muscle contraction		
12.	Smooth & skeletal muscle	1. Compare smooth and skeletal muscles with regard to their structure and function.	1. Lecture 2. Tutorial	BCQs

1.2.3 BLOOD:

S.NO.	TOPICS	TOPIC OBJECTIVES	LEARNING STRATEGIES	ASSESSMENT TOOLS
1.	Composition of blood	1. Describe the components of blood and their functions 2. Describe the functions of blood	1. Lecture 2. Tutorial	BCQs
2.	Erythropoiesis andfactors affecting erythropoiesis	1. Describe the structure and functions of erythrocytes 2. Draw a flowchart of RBC production 3. Enumerate the sites of erythropoiesis 4. Discuss the humoral, maturation & nutritional factors affecting erythropoiesis	1. Lecture 2. Tutorial	BCQs
3.	Hemoglobin	1. Discuss the formation, functions, fate & pathologies of hemoglobin	1. Lecture 2. Tutorial	BCQs
4.	Anemia And polycythemia	1. Define the following • Anemia • polycythemia 2. Classify anemia on the basis of: • Morphology • Etiology 3. Discuss various types of polycythemia	1. CBL 2. Tutorial	BCQs OSPE
5.	Blood groups	1. Discuss the following: • ABO blood types • Rh blood types • Mismatched blood transfusion hazards • Erythroblastosifetalis	1. Lecture/CBL/Practical 2. Tutorial	BCQs OSPE

6.	Hemostasis	1. Define hemostasis 2. Discuss the events of hemostasis 3. List the contents and functions of platelets 4. Discuss the following: • Intrinsic and extrinsic coagulation pathways • Fibrinolytic mechanism • Factors that prevent clotting in normal vascular system • Conditions that cause excessive bleeding in human beings	1. Lecture /CBL /Practical 2. Tutorial	BCQs OSPE
7.	White blood cells	1. Discuss leukopoiesis and inflammation 2. Differentiate among the types of WBCs on the basis of their function and physical characteristics	1. Lecture /Practical 2. Tutorial	BCQs OSPE
8.	Immunity Antigen, antibody structure Humoral immunity Cell mediated immunity	1. Describe immunity & its types 2. Discuss types & functions of T lymphocytes 3. Discuss the structure and mechanism of action of antigen and antibody 4. Describe the complement system 5. Describe the allergy and hypersensitivity reactions	1. Lecture 2. Tutorial	BCQs OSPE

1.2.4 CARDIOVASCULAR SYSTEM:

S.NO.	TOPICS	TOPIC OBJECTIVES	LEARNING STRATEGIES	ASSESSMENT TOOLS
1.	Structure of heart	1. Discuss the physiology of cardiac muscle and the importance of intercalated discs in cardiac muscle function 2. Compare types of muscles with regard to their structure and function	1. Lecture 2. Tutorial	BCQs
2.	Cardiac muscle	1. Correlate the structure of cardiac muscle with its function	1. Lecture 2. Tutorial	BCQs
3.	Cardiac action potential	1. Discuss the cardiac action potential	1. Lecture 2. Tutorial	BCQs OSPE

		2. Compare the skeletal muscle and heart with regard to their action potentials		
4.	Conduction system of heart	1. Discuss the electrical conduction system of heart 2. Discuss role of SA node in conduction system of heart	1. Lecture 2. Tutorial	BCQs OSPE
5.	Basic electrocardiography	1. Draw electrocardiogram (ECG) of a normally functioning heart 2. Discuss the following: • Myocardial events • 12 lead ECG • Tachycardia • Bradycardia • Myocardial infarction/ischemia • Atrial flutter • Atrial fibrillation • Heart blocks 3. Define the cardiac vector and axis of heart	1. Lecture /Practical 2. Tutorial	BCQs OSPE
6.	Cardiac cycle heart sounds	1. Discuss the cardiac cycle	1. Lecture 2. Tutorial	BCQs OSPE
7.	Cardiac output and factors affecting cardiac output	1. Discuss the following: • Cardiac output • Frank starling law • Nervous and chemical factors that alter heart rate, stroke volume and cardiac output	1. Lecture 2. Tutorial	BCQs OSPE
8.	Hemodynamics	1. Discuss the physical characteristics of circulation 2. Discuss the interrelationships of pressure, blood flow and resistance 3. Discuss vascular distensibility and functions of arterial and venous systems	1. Lecture 2. Tutorial	BCQs

9.	Blood pressure & its regulation	1. Define: • Systolic blood pressure • Diastolic blood pressure • Mean arterial blood pressure • Pulse pressure 2. Discuss short, intermediate and long term regulations of blood pressure 3. Describe renin angiotensin aldosterone system	1. Lecture/CBL/Practical 2. Tutorial	BCQs OSPE
10.	Local control of blood flow	1. Discuss the following: • Local control of blood flow • Humoral control of circulation	1. Lecture 2. Tutorial	BCQs
11.	Microcirculation	1. Discuss the capillary system, vasomotion and fluid filtration across capillaries	1. Lecture 2. Tutorial	BCQs OSPE
12.	Shock	1. Discuss the physiological causes of shock	1. Lecture 2. Tutorial	BCQs

1.2.5 RESPIRATORY SYSTEM:

S.NO.	TOPICS	TOPIC OBJECTIVES	LEARNING STRATEGIES	ASSESSMENT TOOLS
1.	Respiratory passageways, alveoli	1. List the structures that make up the respiratory system in correct order 2. Discuss the functions of each structure of respiratory system 3. Differentiate between the conducting and respiratory zones of respiratory passages	1. Lecture 2. Tutorial	BCQs
2.	Pulmonary ventilation	1. Describe the roles of muscles of respiration in breathing 2. Discuss: • Pressure gradients • Significance of dead space • Boyle's law	1. Lecture 2. Tutorial	BCQs
3.	Lung volumes and capacities	1. Describe lung volumes and capacities in adult male	1. Lecture/Practical 2. Tutorial	BCQs OSPE

4.	Gas exchange	1. Discuss the relationship of partial pressure to a gas mixture 2. Describe partial pressures of oxygen and carbon dioxide in venous and arterial blood, alveolar air and cells 3. Discuss factors affecting exchange through respiratory membrane 4. Compare inspired and alveolar air with regard to their composition	1. Lecture 2. Tutorial	BCQs
5.	Transport of gases	1. Discuss the role of partial pressure in gas transport by the blood 2. Describe the transport of oxygen and carbon dioxide in blood	1. Lecture 2. Tutorial	BCQs
6.	Oxygen-Hb dissociation curve	1. Discuss the role of Hb in oxygen transport 2. Describe the factors affecting release or binding of oxygen to Hb 3. Discuss Bohr's and Haldane effects 4. Interpret the oxygen Hb dissociation curve graph	1. Lecture 2. Tutorial	BCQs OSPE
7.	Regulation of respiration	1. Describe the role of four main groups of nuclei in the medulla and pons that control breathing 2. Discuss the factors that can influence rate and depth of breathing 3. Describe locations of chemoreceptors that monitor blood PH and gas concentrations 4. Discuss the role of chemoreceptors in the regulation of respiration	1. Lecture 2. Tutorial	BCQs OSPE
8.	Respiratory disorders/hypoxia	1. Discuss the causes of these respiratory disorders: • Emphysema • Bronchitis • Asthma • Pneumonia • Pulmonary edema • Hypoxia	1. CBL 2. Tutorial	BCQs OSPE

1.2.6 NEUROSCIENCE:

S.NO.	TOPICS	TOPIC OBJECTIVES	LEARNING STRATEGIES	ASSESSMENT TOOLS
1.	Electrical properties of neuron	1. Describe the basic organization of nervous system 2. Discuss electrical conduction across neuronal membrane, generation of action potential and transmission of nerve signal	1. Lecture 2. Tutorial	BCQs
2.	Synapse	1. Define synapse 2. List the properties of synapse 3. Discuss transmission of electrical signals between neurons	1. Lecture 2. Tutorial	BCQs
3.	Receptors	1. Describe the general characteristics of receptors 2. Classify receptors according to location and stimulus type 3. Discuss the following: • Receptor potential • Transduction of sensory stimuli into nerve impulses	1. Lecture 2. Tutorial	BCQs
4.	Sensory pathways	1. List the different types of sensory pathways 2. Discuss the transmission of sensory information into CNS (DCML) 3. Discuss the transmission of sensory information into CNS (Anterolateral system)	1. Lecture 2. Tutorial	BCQs OSPE
6.	Types of pain	1. Discuss types of pain, their qualities and pain receptors 2. Discuss dual pathways for transmission of pain signals into CNS	1. Lecture /CBL 2. Tutorial	BCQs
7.	Analgesia system	1. Discuss analgesia system in the brain and spinal cord 2. Describe brain opioids system	1. Lecture 2. Tutorial	BCQs
8.	Spinal level of motor control	1. Discuss the organization of spinal cord for motor functions 2. Describe the role of muscle spindles &golgi tendon organs in muscle control 3. Discuss cord reflexes	1. Lecture/Practical 2. Tutorial	BCQs OSPE
9.	Descending tracts (pyramidal)	1. Describe the pathway of pyramidal efferent tracts	1. Lecture 2. Tutorial	BCQs OSPE
10.	Descending tracts (extra pyramidal)	1. Compare pyramidal and extra pyramidal tracts with regard to their origin, termination and	1. Lecture 2. Tutorial	BCQs

		function		
11.	Brainstem	1. Describe the major functions of: • Mid brain • Pons • Medulla oblongata 2. Discuss the control of motor functions by the brain stem	1. Lecture 2. Tutorial	BCQs
12.	Cerebellum	1. Discuss the structure, functions, input and output connections of cerebellum 2. Describe various cerebellar disorders	1. Lecture/Practical 2. Tutorial	BCQs OSPE
13.	Basal ganglia	1. Discuss the structure, functions, pathways and related disorders of basal ganglia	1. Lecture 2. Tutorial	BCQs OSPE
14.	Limbic system	1. List the components of limbic system 2. Describe the functions of components of limbic system	1. Lecture 2. Tutorial	BCQs OSPE
15.	Autonomic nervous system (ANS)	1. Discuss the general organization and activation of ANS 2. Discuss structure and functions of sympathetic, parasympathetic nervous system and adrenal medulla 3. Compare the divisions of the ANS with regard to origin of preganglionic fibers, location of ganglia and neurotransmitter substances 4. Discuss the value of adrenal medullae in the function of the sympathetic nervous system	1. Lecture 2. Tutorial	BCQs OSPE

1.2.7 SPECIAL SENSES & ENDOCRINOLOGY:

S.NO.	TOPICS	TOPIC OBJECTIVES	LEARNING STRATEGIES	ASSESSMENT TOOLS

1.	Vision	1. Draw a labeled diagram of an eye 2. Describe the physiological functions of each part of the eye 3. Discuss refraction and refractory structures of the eye 4. Discuss: • Errors of refraction and their correction • Accommodation • Fluid system of eye • Anatomy of retina • Photochemistry of vision • Visual pathway and associated lesions • Image formation	1. Lecture/Practical 2. Tutorial	BCQs OSPE
2.	Hearing and equilibrium	1. Discuss physiological anatomy of ear 2. Describe the role of ossicles in the process of hearing 3. Draw the auditory pathway 4. Discuss conductive and perceptive deafness 5. Explain the role of vestibular apparatus functions in monitoring equilibrium	1. Lecture/Practical 2. Tutorial	BCQs OSPE
3.	Sense of taste	1. Discuss types of taste sensations and their perception on tongue 2. List factors affecting taste sensation 3. Describe location and activation of taste buds 4. Describe the gustatory pathway	1. Lecture/Practical 2. Tutorial	BCQs OSPE
4.	Sense of smell	1. Describe the location and activation of olfactory receptors 2. Discuss the primary sensations of smell 3. Describe the olfactory pathway to brain 4. Define the following: • Anosmia • Hyposmia • Dysosmia	1. Lecture/Practical 2. Tutorial	BCQs

5.	Classification and mechanism of action of hormones Mechanism of action of hormones	1. Classify hormones 2. Discuss endocrine hormones 3. Discuss the secretion, transport, clearance and mechanism of actions of different hormones 4. Describe the hormone receptors and their activation 5. Differentiate between endocrine and exocrine glands 6. List the major endocrine glands and their locations	1. Lecture 2. Tutorial	BCQs
6.	Hypothalmo-hypophyseal system	1. Describe the following structural and functional relationships of the hypothalamus-pituitary unit 2. Discuss the control, site of action and functions of the adenohypophysis hormones 3. Discuss the effects of hypo and hyper secretions of adenohypophysis hormones 4. Correlate the function of the neurohypophysis and the hypothalamus	1. Lecture 2. Tutorial	BCQs
7.	Anterior and posterior pituitary hormones	1. Discuss the synthesis, secretions and effects of anterior and posterior pituitary hormones	1. Lecture 2. Tutorial	BCQs
8.	Thyroid hormones	1. Describe the formation, secretion, function and regulation of thyroid hormones 2. Discuss disorders of thyroid hormones	1. Lecture/CBL 2. Tutorial	BCQS OSPE
9.	Pancreatic hormones	1. Discuss the following mode of action of insulin release 2. Describe the functions of insulin, glucagon, somatostatin and pancreatic polypeptide	1. Lecture/CBL 2. Tutorial	BCQs OSPE
10.	Calcium homeostasis	1. List the hormones that regulate the calcium and phosphate homeostasis 2. Discuss the functions of parathyroid hormone, vitamin D and calcitonin 3. Describe hypocalcemia and	1. Lecture 2. Tutorial	BCQs OSPE

		hypercalcemia		
11.	Adrenal hormones	1. Describe the site of formation, function and control of secretion of the following adrenal hormones: • Mineralocorticoids • Glucocorticoids 2. Discuss Cushing syndrome, Cushing disease and Addison's disease	1. Lecture/CBL 2. Tutorial	BCQs OSPE

1.2.8 DIGESTIVE & URINARY SYSTEM:

S.NO.	TOPICS	TOPIC OBJECTIVES	LEARNING STRATEGIES	ASSESSMENT TOOLS
1.	Digestive system – Introduction	1. Describe the structural and functional organization of the digestive system 2. Discuss the physiological anatomy of gastrointestinal tract 3. Discuss the characteristic features of GIT smooth muscle	1. Lecture 2. Tutorial	BCQs
2.	Regulation of digestive system	1. Discuss the neural and hormonal control of GIT – Enteric nervous system 2. Describe: • Role of interstitial cells of cajal in generation of basic electrical rhythm (BER) of the GIT • Types of GI reflexes • Correlate the role of interstitial cells of cajal with smooth muscle contractile activity • Contrast the effects of parasympathetic and sympathetic nervous activity in modulating GI activity	1. Lecture 2. Tutorial	BCQs OSPE
3.	Salivation	1. Describe the composition and functions of saliva 2. List the factors that increase salivary secretion 3. Discuss the nervous regulation of salivary secretion	1. Lecture 2. Tutorial	BCQs OSPE
4.	Mastication & swallowing	1. Discuss the chewing and swallowing reflex 2. Describe the function of lower esophageal sphincter 3. Discuss the mechanisms that prevent food from entering the nasal cavity and larynx during	1. Lecture 2. Tutorial	BCQs OSPE

		swallowing		
5.	Stomach & its secretions	1. List the functions of stomach 2. Describe composition of gastric juice & their functions 3. Discuss the phases of gastric secretory activity , gastric emptying and its regulation	1. Lecture 2. Tutorial	BCQs OSPE
6.	Small intestine	1. Describe types of movement in small intestine 2. Discuss the inhibition of motility and secretion in stomach 3. Discuss peristaltic rush and migrating motor complex 4. List structures that increase the absorptive surface area of small intestine 5. Differentiate between segmentation and migrating motor complex of the small intestine 6. Discuss the factors affecting the motility and secretion of food in the stomach 7. Discuss the glands of small intestine with regard to their secretions and functions 8. Describe the function of each enzyme of intestinal brush border 9. Describe the absorption of each type of nutrient in the small intestine	1. Lecture 2. Tutorial	BCQs OSPE
7.	Liver	1. Discuss the composition, formation, conduction and functions of Bile and Bile salts 2. Describe the functions and emptying of gall bladder	1. Lecture 2. Tutorial	BCQs OSPE
8.	Pancreas	1. Describe the composition, function and role of pancreatic secretion 2. Discuss factors which affect the pancreatic secretion 3. Illustrate the phases of pancreatic secretion 4. Discuss the role of hormones in regulating pancreatic secretion	1. Lecture 2. Tutorial	BCQs OSPE
9.	Large intestine, defecation reflex	1. Describe the structure, functions and major types of movements in large intestine 2. Discuss the defecation reflex 3. Discuss functions of internal and external anal sphincters	1. Lecture 2. Tutorial	BCQs OSPE
10.	Gastrointestinal	1. Discuss the secretion and role of	1. Lecture	BCQs

	hormones	following GIT hormones in digestion of food • Cholecystokinin • Secretin • GIP • Gastrin • Gastrin Releasing Peptide • Pancreatic Polypeptide • Somatostatin • Vasoactive Intestinal Polypeptide • Motilin	2. Tutorial	
11.	Kidney function & nephron	1. Discuss the functional anatomy of kidney 2. Define nephron & its types 3. Sketch the structure of nephron 4. Describe parts of a nephron 5. Discuss the functions of kidney	1. Lecture 2. Tutorial	BCQs
12.	Glomerular filtration rate (GFR)	1. Define GFR 2. State the normal range of GFR 3. Describe the glomerular filtration membrane & its function 4. Discuss the forces that promote and oppose glomerular filtration 5. Calculate net filtration pressure	1. Lecture 2. Tutorial	BCQs OSPE
13.	Regulation of GFR	1. Discuss the significance of auto-regulation of GFR 2. Describe the regulation of glomerular filtration by hormones and the nervous system	1. Lecture 2. Tutorial	BCQs OSPE
14.	Tubular reabsorption	1. Discuss passive and active mechanism of transport for tubular reabsorption 2. Discuss reabsorption of fluid by peritubular capillaries 3. Discuss tubular reabsorption along different parts of nephron and its regulation 4. Define tubular load and tubular transport maximum (Tm)	1. Lecture 2. Tutorial	BCQs
15.	Tubular secretion	1. Discuss the tubular secretion process 2. Describe the secretion in different parts of nephron	1. Lecture 2. Tutorial	BCQs
16.	Renal concentrating, diluting mechanism	1. Discuss: • Osmotic gradient • Counter current mechanism • Renal mechanisms for excreting • diluted urine • Role of anti-diuretic hormone	1. Lecture 2. Tutorial	BCQs OSPE

		&osmoreceptors		
17.	Micturition reflex	1. Discuss the role of bladder in accommodating a wide range of urine volume 2. Describe the neural reflex pathway that regulates emptying of bladder	1. Lecture 2. Tutorial	BCQs OSPE
18.	Hormones acting on kidney	1. Discuss the effect of following hormones on kidney • ADH • Aldosterone • Angiotensin II • ANP • PTH	1. Lecture 2. Tutorial	BCQs

PHYSIOLOGY PRACTICALS:

S.NO.	PRACTICAL TOPICS By the end of the session the first year BDS student should be able to demonstrate the following	TEACHING METHODOLOGY	ASSESSMENT TOOLS The students will be assessed in mid-term and final examination through:
1.	Introduction to microscope	Demonstration	OSPE/ VIVA
2.	Osmotic Fragility	Demonstration and Performance	OSPE/ VIVA
3.	Erythrocyte Sedimentation Rate	Demonstration and Performance	OSPE/ VIVA
4.	Peripheral Blood Film	Demonstration and Performance	OSPE/ VIVA
5.	Blood Grouping	Demonstration and Performance	OSPE/ VIVA
6.	Bleeding time Clotting time	Demonstration and Performance	OSPE/ VIVA
7.	Muscle Twitch	Demonstration and performance	OSPE/ VIVA
8.	Summation Tetanization Fatigue	Demonstration and performance	OSPE/ VIVA
9.	Heart sounds	Demonstration and performance	OSPE/ VIVA

10.	ECG	Demonstration and performance	OSPE/ VIVA
11.	Blood Pressure Estimation	Demonstration and performance	OSPE/ VIVA
12.	Lung volumes and capacities	Demonstration and performance	OSPE/ VIVA
13.	Spirometry	Demonstration and performance	OSPE/ VIVA
14.	Superficial reflex	Demonstration and performance	OSPE/ VIVA
15.	Deep reflex	Demonstration and Performance	OSPE/ VIVA
16.	Cerebellar Function Testing	Demonstration	OSPE/ VIVA
17.	Visual acuity	Demonstration and Performance	OSPE/ VIVA
18.	Color vision	Demonstration and Performance	OSPE/ VIVA
19.	Test of hearing	Demonstration and Performance	OSPE/ VIVA

RECOMMENDED PHYSIOLOGY BOOKS (Latest editions):

1. Textbook Of Medical Physiology by Guyton And Hall 14th Edition
2. Human Physiology by Lauralee Sherwood 9th Edition
3. Ganong's Review of Medical Physiology 26th Edition