STUDY GUIDE

1st Year BDS

Integrated Curriculum 2025

Table of Contents

Introduction to Study Guide

Welcome to the 1st Year BDS program at CMH Lahore Medical College & Institute of Dentistry. This study guide has been created especially for you to serve as a reliable companion throughout your first year. It is designed not only to share what you will study, but also to explain why each part of your training is important and how it contributes to your development as a future dental professional. Inside this guide, you will find the program outcomes, block-wise and module-wise objectives, teaching methods, contact hours, and assessment strategies. By having all this information in one place, you can plan your studies more effectively, stay organized, and approach each subject with clarity.

One of the most valuable aspects of this guide is its integrated approach. You will see how Anatomy, Physiology, Biochemistry, and Oral Biology connect with each other, and how these foundations link with your future dental practice. This not only makes learning meaningful but also prepares you to think critically and apply knowledge in real clinical settings. Beyond academics, this guide also highlights institutional policies, feedback opportunities, and support services available to you. It emphasizes the values of professionalism, ethics, leadership, and research, which are vital qualities for any healthcare provider.

Remember, this study guide is not just a document—it is a learning tool meant to empower you. Use it to track your progress, align your efforts with assessments, and make the most of the resources available. By taking ownership of your studies and following the structure provided here, you will be able to build strong foundations and set yourself up for success in dentistry.

We are confident that, with your dedication and the support of your faculty, this guide will help you excel in your first year BDS at CMH LMC & IOD.
Wishing you a rewarding and successful journey ahead!

School of Health Professions Education
CMH Lahore Medical College & Institute of Dentistry

Vision of National University of Medical Sciences

To be the best medical university by conducting world-class bio-medical research and creative research activities that develop knowledge and contribute to improve the health care system and social advancement for the people of Pakistan and benefit humanity as a whole with a standard of excellence.

Mission of National University of Medical Sciences

Our mission is to emphasize rigorous research fundamentals while stimulating innovation and providing talented students and faculty with the high standard research facilities in the colleges/institutions of NUMS, necessary to achieve excellence in bio-medical research to contribute toward best care for our individuals and communities, embraces the challenges of health disparities and improve health care system up to international standards.

Vision of CMH Lahore Medical College and Institute of Dentistry

To be a leading institute in medical education that provides an inclusive and conducive environment to foster excellence in teaching, learning, acquisition of clinical skills, research, and innovation to improve future health indicators within our region and beyond.

Mission of CMH Lahore Medical College and Institute of Dentistry

To improve healthcare by:

1. Providing quality medical education that prepares healthcare professionals according to internationally accepted benchmarks for empathy, social accountability, lifelong learning, critical thinking, and sound clinical acumen.
2. Ensuring a conducive and equitable learning environment in research and continuous professional development for students and faculty respectively, enabling their success in national and international licensure examinations and opportunities.
3. Fostering evidence-based and patient-centered care to efficiently address global healthcare challenges, focusing on prevention and community health improvement.

Vision of Institute of Dentistry

To advance dental education, research, and oral health care.

Mission of Institute of Dentistry

- Prepare learned, skilled, and ethical dental professionals for comprehensive and evidence-based practice.
- Conduct research to advance knowledge and practices.
- Promote community oral health and disease prevention.

BDS Program Outcomes

At completion of four-year BDS program, dental graduates of Institute of Dentistry CMH Lahore Medical College will be able to:

1. Manage diverse patients with common oral and dental diseases using patient-centered evidence-based dentistry.
2. Identify and refer patients requiring specialized oral health care.
3. Advocate preventive measures to address community oral health needs.
4. Demonstrate appropriate verbal and written communication skills.
5. Display professional, equitable, ethical and culturally appropriate behavior.
6. Engage in life-long learning for continuous professional development.
7. Demonstrate basic research skills on oral health issues.
8. Work in health care teams and provide leadership where required.

Curricular Framework

BDS 4 Years Curricular Framework

Scheme Of Studies

1st Year	2nd Year	3rd Year	Final Year
Anatomy + Clinical Lectures	Science of Dental Material	Periodontology	Prosthodontics
Physiology+ Clinical Lecture	Gen. Pathology & Microbiology	Oral Pathology	Operative Dentistry
Biochemistry + Clinical Lecture	Pharmacology	Oral Medicine	Oral & Maxillofacial Surgery
Oral Biology & Tooth Morphology + Clinical Lecture / Clinical Rotation	Behavioural Sciences	Gen. Medicine	Orthodontics
Pak studies & Islamic Studies	Community & Preventive Dentistry	Gen. Surgery	
	Pre- Clinical Prosthodontics	Oral & Maxillofacial Surgery	
	Pre- Clinical Operative Dentistry	Prosthodontics	
		Behavioural Sciences	Paedontics
		Operative Dentistry	
Research Methodology			
Professionalism & Leadership			Dental Entrepreneurship
Expository Writing			
Computer Skills			
Dental Photography			

Contact Hours Distribution
1st Year BDS

SUBJECTS	Teaching Hours
Anatomy	300
Physiology	300
Biochemistry	170
Oral Biology	170
Pre-clinical (Operative & Prosthodontics)	4
Orthodontics	4
Operative	3
Oral Pathology	4
Periodontology	2
OMFS	2
Oral Medicine	3
Community Dentistry	2
Dental Material	3
Prosthodontics	3
Research Methodology & EBM	10
Total Hours	980
Quran Kareem	25
Islamiat	25
Pakistan Studies	25
Expository writing	25
Computer skills	25
Leadership and Management	05
Professionalism	05
Co- curricular activities/sports	50

Elective courses (select any one)	
Clinical Photography & Videography	25
Strategies for Enhanced and Advanced Learning	
Total Hours	**210**
Grand Total	**1190**

Feedback Mechanisms

Integrated evaluation forms enable students and faculty to provide input for continuous improvement.

To ensure privacy and security:

- Students: Receive personalized logins to access course materials.
- Faculty: Have permissions to upload content, grade assignments, and track student progress.
- SHaPE & L-QEC: Monitor and evaluate LMS activities to monitor quality.
- IT Support: Manage user accounts, system updates, and security.

Special access requests are managed through the CE Secretariat in consultation with the IT department. Assessments are designed to support learning and maintain academic rigor:

- Formative Assessments: Quizzes and assignments contribute to assessment for learning but do not count toward final grades.
- Summative Assessments: Online term exams and send-ups.
- Feedback and Quality Assurance: Student evaluations collected through QEC proformas ensure ongoing improvement of online teaching practices.

CMH Lahore Medical College – Policies

- Attendance and disciplinary policy https://cmhlahore.edu.pk/wp-content/uploads/2024/10/std-policy.pdf
- Policy for Steering Committee for the Selection of Class Representatives (BR and GR) Based on Student Feedback https://cmhlahore.edu.pk/wp-content/uploads/2025/01/Steering-committee.pdf
- Social Media Policy for Faculty, Staff, and Students https://cmhlahore.edu.pk/wp-content/uploads/2024/02/Social-Media-Policy-for-students-02-08-2023.pdf
- Code of Conduct https://cmhlahore.edu.pk/wp-content/uploads/2024/02/SOP-Code-of-Conduct-27-02-24.pdf
- Internet Usage Policy https://cmhlahore.edu.pk/wp-content/uploads/2023/09/CMH-Internet-Usage-Policy-02-08-2023.pdf
- Healthcare Facility https://cmhlahore.edu.pk/wp-content/uploads/2023/09/Health-Care-Facility.pdf
- Complaint Cell https://cmhlahore.edu.pk/wp-content/uploads/2023/09/Complaint-Cell-CMH-LMC-IOD.pdf
- Retake Policy (For Internal Assessment Only) https://cmhlahore.edu.pk/wp-content/uploads/2023/05/ion-Updated-Retake-Policy-2.pdf
- Drug and tobacco abuse/smoking https://cmhlahore.edu.pk/wp-content/uploads/2022/11/SOP-Drug-and-Tobacco.pdf
- Sexual harassment https://cmhlahore.edu.pk/wp-content/uploads/2022/11/Sexual-Hars-policy.pdf
- Disciplinary Committee Policy https://cmhlahore.edu.pk/wp-content/uploads/2025/05/SOP-Disciplinary-Committee-CMH-LMC-IOD.pdf
- Co-curricular Activities https://cmhlahore.edu.pk/wp-content/uploads/2022/11/Co-curricular-privacy-policy.pdf
- Electives Policy https://cmhlahore.edu.pk/wp-

content/uploads/2022/11/electives-policy.pdf

- CMH LMC Formative Assessment and Feedback Policy https://cmhlahore.edu.pk/wp-content/uploads/2022/11/CMH-LMC-Formative-Assessment-and-Feedback-Policy.pdf

Assessment Plan for BDS

The assessment plan comprises 3 block exams (1st year to 3rd year)/ 2 term exams (final year), 1 send-up, and 1 professional examination. Examination consists of one-best multiple-choice questions and short essay type questions along with OSPE/OSCE. All exams except for University's exam/professional exam contribute towards internal assessment of the respective subjects according to the institutional policy. The assessment schedule is given below:

Type of Assessment	Weightage	Frequency and Time	Methods/ Tools for Assessment
Formative		Informally during and after the session	Class tests (MCQs, SEQs, SAQs), Class presentations, Assignments, Tutorials, Case Based Discussions, Portfolios
Summative	Continuous Internal assessment 20%	3 block exams (1st year to 3rd year), 2 term exams (final year), Send up (before the professional exam) (80%) Attitude/ behavior/ attendance/ assignments/ achievements (throughout the year) (20%)	MCQs, SAQs, SEQs, OSPE, OSCE, CBD, Viva, Log Books
	University exam 80%	Once at the end of academic year	MCQs, SAQs, SEQs, OSPE, OSCE, Viva

CMH LAHORE MEDICAL COLLEGE
INSTITUTE OF DENTISTRY

ACADEMIC CALENDAR

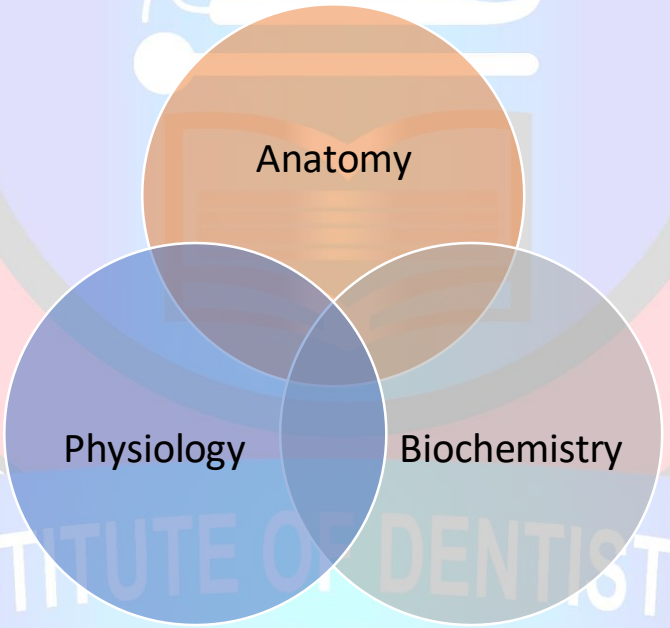
Theme: Basis of Medicine I										
Blocks	**BLOCK-I 13+1= 14 weeks**				**BLOCK-II 10+1= 11 weeks**			**BLOCK-III 10+1= 11 weeks**		
Duration	**02 wks**	**03 wks**	**03 wks**	**05 wks**	**02 wks**	**04 Wks**	**04 Wks**	**02 Wks**	**02 Wks**	**06 Wks**
Modules	**Foundation I**	**Cell Structure & Function**	**Heamatology & Immunology**	**CVS**	**Respiratory System**	**Endocrinology & Reproduction**	**Craniofacial**	**Digestive system & Metabolism**	**Renal system**	**Neuroscience**

Blocks	**BLOCK-I 13+1= 14 weeks**				**BLOCK-II 10+1= 11 weeks**		**BLOCK-III 10+1= 11 weeks**	
Duration	**02 Wks**	**03 Wks**	**05 Wks**	**03 Wks**	**4 Wks**	**6 Wks**	**4 Wks**	**6 Wks**
Themes	**Essentials Of Dentistry I**				**Dental & Periodontal tissues in Health & Disease**		**Craniofacial Structures: A Comprehensive Learning**	
Modules	**M I** Orofacial Biology	**M II** Tooth Form & Function	**M III** Growth & Development	**M IV** Dental Tissues	**M V** Periodontal Tissues	**M VI** Tooth Morphology & Physiology	**M VII** Oral Mucosa	**M VIII** Paraoral Structures
Integrated subjects	General Anatomy	Preclinical Operatives	Oral Pathology OMFS Orthodontics General Anatomy	Preclinical Operatives, Science of dental Materials, Operative Dentistry Oral Pathology	Oral Pathology Prosthodontics Periodontology Orthodontics Operative dentistry	Orthodontics Operative dentistry Pre-operative dentistry	Preclinical Prostho Oral Pathology Oral Medicine Orthodontics Community & Preventive Dentistry General Anatomy	Prosthodontics Oral Medicine General Anatomy

BDS YEAR I

SPIRAL I

Theme: BASIS OF MEDICINE - I



BLOCK-I

Preamble: Block I mark the beginning of your journey as a dental student. In this stage, you will be introduced to the fundamental sciences that form the bedrock of dentistry and medicine alike. The modules in this block cover the structure and function of the cell, the composition and physiology of blood, the basics of immunity, and the workings of the cardiovascular system. You will also have an introductory exposure to dentistry through the Essentials of Dentistry module, giving you a first look at your chosen profession. This block focuses on developing a strong conceptual foundation. By understanding cell biology and biochemical pathways, you will begin to see how the smallest units of the body support overall health and respond to disease. The study of hematology and immunology provides insight into defense mechanisms and how these processes impact oral and systemic health. Cardiovascular physiology and anatomy will help you appreciate how circulation affects tissues, healing, and responses to treatment.

Another important aspect of Block I is the early integration of dental relevance. For example, by learning about blood and immunity, you will understand why infection control and asepsis are critical in dental practice. By exploring cardiovascular function, you will appreciate why dentists need to be mindful of systemic conditions such as hypertension when treating patients. By the end of this block, you should have a solid scientific foundation, the ability to connect microscopic processes to organ-level physiology, and the readiness to move forward into more specialized systems.

MODULE I - FOUNDATION MODULE

Duration: 02 weeks

ANATOMY				
Topic/ Theme	**Learning Outcomes**	**Learning Objectives/ Contents**	**Instructional Strategy**	**Assessment Tool**
	By the end of the module students will be able to:			
General Anatomy				
Introduction to anatomical terms and planes	Comprehend basic terminology and planes of the sections to facilitate further knowledge	**Knowledge** Define different disciplines of Anatomy Identify terms of position in relation to anatomical position: • Anterior /Posterior • Ventral /Dorsal • Superior /Inferior • Caudal / Rostral / Cranial • Medial /Lateral • Proximal /Distal • Palmar /plantar • Superficial/Deep • Supine /Prone Identify the following anatomical planes with the help of diagrams. • Coronal • Sagittal • Horizontal • Parasagittal Identify the various techniques to study anatomy in the living such as Plain radiographs **Skill:** Identify type of section on a model Demonstrate normal anatomical position in a SP	• Lectures • SGD	• MCQ • SAQ/SEQ/ OPSE/ Structured viva

	Appraise the movements occurring at different types of movements	**Knowledge** Identify the terms of movements with general reference to the axis and planes in which they occur	• Lectures • SGD	• MCQ • SAQ/SEQ • OPSE/ Structured viva
	occurring at different joints of the body .	• Flexion /Extension • Abduction /Adduction • Lateral rotation / Medial rotation • Pronation /Supination • Plantar flexion / Dorsal flexion • Circumduction • Eversion /Inversion **Skill:** Demonstrate these movements in a subject		
Osteology	Summarize the general features of bones.	• Identify the axial and appendicular parts of a human skeleton. • Classify bones according to their development and shape giving examples of each type especially from head and neck (wherever possible). • Describe the process of both types of ossification • Describe blood supply of the long & diploic bones		
Myology	Appraise the general features of muscles	Classify muscles into three basic types Correlate skeletal muscles according to their shape, Muscle fibre types and functions with examples of each type		

Arthrology	Anatomize the general Features of joints Classify joints According to their structure with examples of each type especially from head and neck (wherever possible)	Describe the general structure of a synovial joint Discuss anatomy of joints with reference to dislocation, sprain, and inflammation Describe Hilton's law		

PHYSIOLOGY				
Introduction	Comprehend the basic concepts of Physiology	Describe the organization of human body (from cell to multicellular organism)	LGIS	Assignment
BIOCHEMISTRY				
Introduction to Biochemistry	Comprehend the basic concepts of biochemistry	• What is Biochemistry? • The scope ofbiochemistry ▪ Importance of biochemistry	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva

MODULE II - CELL STRUCTURE & FUNCTION

Duration: 03 weeks

ANATOMY				
Topic/ Theme	**Learning Outcomes**	**Learning Objectives/ Contents**	**Instructional Strategy**	**Assessment Tool**
	By the end of the module students will be able to:			
Gametogenesis	Elaborate the development of germ cell	• Revisit cell division, mitosis &meiosis • Describe the events of spermatogenesis • Describe the events of spermiogenesis • Describe the relation of ovarian cycle with maturation of follicles. • Describe the stages of follicular maturation - Primary - Preantral - Secondary - Preovulatory. • Describe the process of ovulation and correlate its timing with ovarian cycle. • Define fertilization • State normal site of fertilization • Describe the results of fertilization • Enlist the factors affecting fertilization • Enumerate the changes that occur in spermatozoa before fertilization • Explain the factors affecting penetration of sperm through the zona pellucida for formation of Pro-nuclei.	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ/ OPSE/ Structured viva
First week of Development	Appraise the events of first week of development of the embryo	• Appraise the implantation and its normal site • Describe the changes in uterus at time of implantation. • Explain the process of cleavage • Explain the formation of morula and blastula	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ/ OPSE/ Structured viva

		• Describe the formation of inner and outer cell mass within the blastocyst cavity • Appraise abnormal sites for implantation (ectopic pregnancy) and its clinical significance.		
Second week of development	Appraise the events of second week of development of the embryo	• Discuss the formation of bilaminar embryonic disc from embryoblast. • Describe early differentiation of trophoblast • Explain the formation of amniotic cavity • Explain the formation of chorion, secondary yolk sac and chorionic plate. • Explain the establishment of uteroplacental circulation. • Appraise 2nd week as week of twos.	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ/ OPSE/ Structured viva
Third week of development	Appraise the events of third week of development of the embryo	• Define gastrulation (formation of three germ layers) • Discuss the development, significance and fate of primitive streak • Describe the development of notochordal process, notochord canal, prechordal plate and cloacal membrane • Compare the topographic arrangement and derivatives of three components of intraembryonic Mesoderm (Paraxial, Intermediate and Lateral Plate Mesoderm) • Describe early development of CVS. • Describe differentiation of trophoblast during third week and formation of primary, secondary and tertiary	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ/ OPSE/ Structured viva

		chorionic villi • Enumerate the parts of placenta • Explain formation and fate of allantois.		
HISTOLOGY				
Cell	Appraise the light microscopic structure of the cells	**Knowledge** • Introduction to histology, microscope • Differentiate between acidophilic and basophilia. • Enumerate different cell organelles and identify staining reaction of each. • Illustrate shapes of different cells with example • Enumerate different components of the cytoskeleton. • Correlate the structure of different type of intercellular junctions with their functions. **Skills** • Focus the prepared slide at different magnifications. • Draw the labeled diagram of cells having various shapes.	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ/ OPSE/ Structured viva

Epithelium	Appraise the light microscopic structure of epithelial tissue	**Knowledge** • Define epithelium • Compare surface Epithelium with examples of each type. • Classify glandular epithelium with examples of each type. • Compare the ultrastructure of microvilli, stereocilia and cilia and correlate with their roles in various cellular functions • Classify glands according to their morphology, secretory products and mode of secretion with examples of each type **Skills** • Identify different types of epithelia under light microscope and enlist at least two identification points for each type. • Draw labelled diagrams of each type of epithelium. • Compare and contrast between the histological structure of serous and mucous secreting cells. • Draw labelled diagram of mucous and serous acini	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ/ OPSE/ Structured viva

Connective tissue	Appraise the light microscopic structure of connective tissue	**Knowledge** • Define connective tissue and list three basic components of connective tissue. • List different types of cells and fibers in the connective tissue. • Compare various types of connective tissue with example of each type. • Summarize a brief account • of histological features of different types of connective tissue. **Skills** • Identify the slides of loose connective tissue, dense regular, dense irregular and adipose connective tissue under light microscope and list at least two identification points of each type. • Draw labelled diagrams showing light microscopic structure of loose connective tissue, dense regular, irregular and adipose connective tissue	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ/ OPSE/ Structured viva

Muscle		**Knowledge** • Differentiate the microscopic features skeletal, smooth and cardiac muscle while correlating with their functions. • Explain the histological differencesof different types of muscles. **Skills** • Identify microscopic sections of different types of muscle under light microscope and list at least two identification points of each type • Draw labelled diagrams showing light microscopic structure of different types of muscles**.**	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ/ OPSE/ Structured viva
Bone	Appraise the light microscopic structure of bone	**Knowledge** • Compare microscopic structure of compact and cancellous bone. • Correlate the process of bone remodeling with tooth bracing and adjustment. **Skills** • Identify the slides of cancellous and compact bone under light microscope and list at least two identification points of each type. • Draw labelled diagrams showing light microscopic structure of cancellous and compact bones.	▪ Lectures ▪ SGD	▪ MCQ ▪ SAQ/SEQ/ OPSE/ Structured viva
PHYSIOLOGY				
CELL & GENERAL PHYSIOLOGY				
Topic/ Theme	**Learning outcomes**	**Learning Objectives/Contents**	**Instructional strategies**	**Assessment tool**

Homeostasis	Appraise functional Organization of the Human Body and Control of the "Internal Environment"	• Recognize the interplay of various organ systems in maintaining homeostasis. • Identify the role of feedback mechanisms (positive, negative, feed forward) in maintaining 'internal milieu'. • Differentiate between composition of intracellular and extra cellular fluid	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
Cell Physiology	Relate the structure of cell and its various components to metabolic processes, genetic control and locomotion	• Revisit the structure and function of the cell and its organelles (cell Membrane, cytoplasmic organelles, nuclear membrane, nuclear organelles) • Classify various • Compare and contrast modes of transport of substances across the cell-membrane with examples • (osmosis, diffusion, facilitated diffusion, primary active transport, secondary active transport)	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
NERVE & MUSCLE				
Membrane Potentials and Action Potentials	Differentiate various types and phases of action potentials on the basis of nerve morphology, concentration of ions in body fluid compartments and clinical significance.	• Appraise basis of development of membrane potential across excitable membrane. • Recognize Nernst potential and its importance in generation of membrane potential. • Identify various factors/mechanisms responsible for the genesis of membrane potential (role of channels, carrier proteins, stimuli). • Illustrate different phases of action potential mentioning details of ionic changes occurring during each phase of	LGIS	▪ MCQ ▪ SAQ/SEQ· ▪ Structured viva

		action potential. • Distinguish types and importance of refractory period. • Differentiate between myelinated and non-myelinated nerve fibers based on their structure and characteristics.		
Excitation contraction coupling and NMJ	Correlate the physiological mechanism of Neuromuscular, Transmission and Excitation-Contraction Coupling with various neuromuscular diseases.	• Tabulate macroscopic, microscopic, functional differences of smooth, skeletal and cardiac muscle • Illustrate neuromuscular junction, sequence of events taking place during neuromuscular transmission • Explain the physiological importance of a motor unit • Describe the ionic and chemical basis of muscle contraction. • Distinguish between phases of muscle contraction in detail. • Relate the pathophysiology of neuromuscular transmission in myasthenia gravis	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
Excitation and Contraction of Smooth Muscle	Appreciate characteristics of smooth muscle contraction with their physiological significance.	Describe the role of SER in smooth muscle contraction.	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
Practicals /SGDs: 1. Microscopy 2. Record the Blood Pressure of an SP using palpatory and Auscultatory Method. 3. Record the effects of posture and Exercise on Blood Pressure				

BIOCHEMISTRY				
Topic/ Theme	**Learning outcomes**	**Learning Objectives/Contents**	**Instructional strategies**	**Assessment tool**
Cell Structure & Function	Cell Cytology	• Cytological techniques - Centrifugation - Ultracentrifugation • Differential Centrifugation	• Lectures SGD	• MCQ • SAQ/SEQ • Structured viva
	Understand the biochemical aspects of **a cell membrane**	• Overview of biochemical composition of a cell membrane • Describe the biochemical significance of different types of membranes - RBCs - Mitochondria, Nucleus, ER, Golgi apparatus etc	• Lectures SGD	• MCQ • SAQ/SEQ • Structured viva
	Understand Cell Organelles, biochemical aspects of **cell organelles** along with their associated Disorders-	• Overview of various Cell Organelles with their biochemical composition, functions and associated disorders - Nucleus (Replication & Transcription) - Ribosomes (Translation) Peroxisomes (FA metabolism, antioxidant functions, signaling) - Mitochondria (ETC, TCA, β oxidation of FA, Heme biosynthesis, Urea cycle etc) - Golgi Apparatus (post translational modification, Metabolism of FA) - Endoplasmic Reticulum (FA synthesis, transport of various secretory	• Lectures SGD	• MCQ • SAQ/SEQ • Structured viva

		vesicles) - Lysosomes (degradation of glycogen and fat)		
	Relate the concept of biochemical processes in relation to signal transduction in health and disease	• Describe the chemistry of cell surface and intracellular receptors and related signaling mechanism • Elaborate the role of signal transduction in health and disease - Cholera - Pertussis	• Lectures • SGD	• MCQ • SAQ/SEQ • Structured viva
	Relate the concept of specialized cellular transport mechanisms	• Overview various membrane transport mechanisms - GLUTs - SGLT - Carnitine shuttle - H/K ATPase pump - Cl ion channels (Cystic fibrosis) - Malate shuttle - Receptor mediated endocytosis - Glyceraldehyde phosphate shuttle - Aquaporins • ATP sensitive K Channel	• Lectures • SGD	• MCQ • SAQ/SEQ • Structured viva
Geetics	Apply the knowledge of genetics and molecular biology in treatment of diseases	• Overview of replication, transcription & translation (not the steps) • Mutations • Role of genetics in cancer development • Molecular Biology technique- PCR • Molecular Biology and role in treatment of	• Lectures • SGD	• MCQ • SAQ/SEQ ▪ Structured viva

		diseases (cloning, gene therapy)		

Practicals:

Blood sample collection and storage Safety in laboratories

Introduction to use of glassware

Introduction to use of Laboratory Equipment-I

- Micro lab
- Incubator
- Water Bath

Introduction to use of Laboratory Equipment-II

- Hot Air Oven
- Centrifuge Machine
- Electric Balance
- pH Meter

MODULE III - HAEMATOLOGY & IMMUNOLOGY

Duration: 03 weeks

ANATOMY				
Topic/ Theme	**Learning Outcomes**	**Learning Objectives/ Contents**	**Instructional Strategy**	**Assessment Tool**
	By the end of the module students will be able to:			
Week 6- 8		**Hematology & Immunology**		
GENERAL EMBRYOLOGY				
Embryonic period (3-8 wks)	Appraise the early weeks of development of embryo	• Define neurulation. • Describe process of formation of neural plate, neural tube and neural crest cells. • List derivatives of: - Surface ectoderm - Neurectoderm - Neural crest - Intraembryonic mesoderm (paraxial, intermediate, lateral plate) - Endoderm • Describe early differentiation of somites • Describe the development of intraembryonic coelom. • Describe the folding of the embryo in the median plane and correlate it with its consequences • Describe the folding of the embryo in the horizontal plane and correlate it with its consequences • Describe relocation of connecting stalk to the • anterior abdominal wall and its differentiation into umbilical cord. **Skills** • Identify the structures related to general development on given models of general embryology	Lectures/ SGD	▪ MCQ SEQ ▪ Viva /OSPE

Histology				
Lymphoid system	Appraise histological structure of different components of lymphoid system	**Knowledge** • Enumerate different types of lymphoid cells and identify their distribution in the body • Describe the histological features and cells of the lymphoid system • Describe the histological features of tonsils, thymus, lymph node and spleen. **Skills** • Identify histological sections of tonsils, thymus, lymph node and spleen. • under light microscope and list at least two identification points of each.	Lectures/ SGD	▪ MCQ ▪ SEQ ▪ Viva /OSPE
GROSS ANATOMY				
Neurovasculature of limbs	Correlate anatomy of nerves and vessels of limbs with common clinical presentations.	**Knowledge** • Outline the formations, divisions and branches of the brachial plexus • Outline the area of supply of axillary, radial, ulnar, median and sciatic nerves. • Trace the route of main arteries and veins of upper and lower limbs. • Analyze the clinical importance of vessels present in the cubital fossa. • Identify veins commonly used for cannulation • Elucidate the clinical significance of brachial and radial artery with reference to pulse and BP monitoring. • Enumerate arteries forming trochanteric and cruciate anastomoses and describe their importance. • Discuss superficial and deep	Lectures/ SGD	▪ MCQ ▪ SEQ ▪ Viva /OSPE

		venous drainage of the lower limb.		
		• Define the importance of great saphenous vein in CABG. • Discuss the anatomical basis of varicose veins. Define aneurysm. **Skills** **<u>Surface marking</u>** • Mark the following vessels on a subject Ulnar and radial artery • Cephalic and basilic vein • Identify main arteries and veins supplying the upper and lower limb on a model. • Examine pulses of upper and lower limb in a subject.		
PHYSIOLOGY				
HEMATOLOGY AND IMMUNOLOGY				
Topic/ Theme	**Learning outcomes**	**Learning Objectives/Contents**	**Instructional strategies**	**Assessment tool**
Hemopoiesis	Describe the Morphology and Genesis of blood cells	• Differentiate between various types of blood cells on the basis of their morphological and physiological characteristics. • Overview sites of hemopoiesis in the body during different stages of life along with composition and • Functions of bone marrow. • Identify the factors regulating erythropoiesis and maturation of RBC. • Appreciate the composition of blood and general functions of blood. • Explain different types of plasma proteins with their functional significance	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva

Red Blood Cells Dyscrasias	Differentiate between various types of anemias and their clinical and lab presentation	• Relate the morphology and physiology of different types of hemoglobin • Compare and contrast different types of anemia on the basis of etiology, pathophysiology, clinical • presentations and blood picture. • Describe etiology, pathophysiology and clinical presentation of polycythemia.	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
WBCs & Immunity	Classify different types of immunity on the basis of cell types and their role in defense mechanism.	• Relate the morphology and physiology of different WBCs with clinical presentations of leucopenia, leukocytosis and leukemia. • Appraise the clinical significance of RES reticuloendothelial system. • Describe pathophysiology of inflammation and necrosis • Describe the physiological basis of vaccination.	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
Hemostasis and Blood Coagulation	Compare and contrast various bleeding disorders.	• Identify role of cells and proteins involved in the process of maintaining hemostasis. • Differentiate between intrinsic and extrinsic regulations of blood coagulation • Discuss the morphology, • etiology, pathophysiology and clinical presentation of thrombocytopenia, thrombocytosis and hemophilia	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
Blood grouping and Transfusion reactions	Analyze transfusion reactions	• Explain the principles of blood grouping keeping in view their physiological significance. • Identify the various blood groups and hazards of matched and mismatched blood	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
BIOCHEMISTRY				

Enzymes	Apply the basic concepts of enzymes	• Introduction, Definition, Classification • Mechanism of catalysis • Coenzymes, co-factors and their Biomedical role in human body • Km, Vmax-concept of Enzyme Kinetics and biomedical importance • Factors affecting enzymes activity in the human body • Michaelis-Menten Equation and its biomedical importance (no derivation of equations) • Enzyme inhibitors and their classification and biomedical importance • Regulation of enzyme activity overview • Overview of Vitamins as coenzymes (B1, B2, B3, B6, biotin, pantothenic)	• Lecture • SGD • MCQ • SAQ/SEQ • Structured viva	
Hemoglobin	Correlate the biochemical basis of Hemoglobin with clinical conditions	• Chemistry and biosynthesis of haemoglobin • Structure, functions and types of hemoglobin • Oxygen binding capacity of hemoglobin, factors affecting and regulating the oxygen binding capacity of hemoglobin • Degradation of heme, formation of Bile pigments, its types, transport and excretion • Hyperbilirubinemia, their biochemical causes and differentiation • Jaundice and its types • Hemoglbinopathies (HP-S, Thalassemia) and their biochemical causes	• Lectures • SGD • PBL • CBL	• MCQ/ SAQ/SEQ
		Hemolytic anemia		

Biochemical basis of Anemia	To understand the biochemical aspects of enzyme and vitamin deficiency in anemia and bleeding disorders	1. G6PD- with reference to HMP shunt and NADPH uses 2. PK deficiency with reference to the clinical significance of glycolysis • Role of Vit B9 & B12 in Nutritional Anemia • Role of Fe in Nutritional Anemia • Role of Vitamin C & K in bleeding disorders	• Lectures • SGD • PBL • CBL	• MCQ/ • SAQ/SEQ
Plasma proteins and Immunoglobulins	Relate the basic knowledge of Plasma proteins to its clinical significance	• Describe Plasma proteins & give their clinical significance- • Draw and label the Structure of Immunoglobulins • Enumerate major types, • functions & Properties of Immunoglobulins	• Lectures • SGD • PBL • CBL	• MCQ/ • SAQ/SEQ
Practicals: **Estimation of serum amylase with micro lab**				

MODULE IV - CARDIOVASCULAR SYSTEM

Duration: 05 weeks

ANATOMY				
Topic/ Theme	**Learning Outcomes**	**Learning Objectives/ Contents**	**Instructional Strategy**	**Assessment Tool**
	By the end of the module students will be able to:			
GENERAL ANATOMY				
Circulatory system	Summarize the general anatomical features of circulatory system	• Justify general plan of systemic, portal and lymphatic circulatory system. • Compare blood vessels according to their size sand functions with examples of each type. • Describe various types of anastomoses with example and their clinical significance	LGIS/ SGD	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva ▪ OSPE
GROSS ANATOMY				
Heart and coronary circulation	Correlate anatomical knowledge of heart and coronary circulation with relevant clinical conditions	**Knowledge** • Describe anatomical position, borders, surfaces and external features of heart. • Outline the main internal features of various chambers of heart • Describe the arterial supply, venous drainage and nerve supply of heart. • Define dominance of heart • Define angina pectoris and myocardial infarction, and explain their anatomical basis in case of coronary artery disease. • Explain anatomical basis of cardiac referred pain in case of ischemic heart disease • Define angioplasty, angiography	LGIS/ SGD	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva ▪ OSPE

		Skills • Locate sites of auscultation of various heart sounds on chest wall of a subject • Identify features of heart on a model.		
PHYSIOLOGY				
CVS				
Topic/ Theme	**Learning outcomes**	**Learning Objectives/Contents**	**Instructional strategies**	**Assessment tool**
Physiological anatomy of heart and cardiac action potential	Appreciate the functional characteristics of cardiac muscle, action potential and cardiac impulse	• Appreciate the physiological arrangement of right and left hearts along with the parallel arrangement of systemic circulation. • Recognize physiological anatomy of cardiac muscles, its functional syncytium and intercalated disc • Differentiate between cardiac, skeletal and smooth muscles based on macro-, microscopic and functional differences, action potentials. • Distinguish ionic changes in different phases of action potential within cardiac muscle • Correlate the phases with ionic changes during pacemaker action potential in heart • Comprehend cardiac impulse transmission	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
Cardiac cycle	Compare and contrast the pressure and volume	• Illustrate pressure and volume changes during various phases of cardiac	LGIS	▪ MCQ ▪ SAQ/SEQ

	changes in different components of circulatory system during cardiac cycle	cycle • Illustrate pressure-volume diagram of left heart • Comprehend preload and afterload, its influence on stroke volume (The Frank-Starling's mechanism) • Discuss the autonomic regulation of heart		▪ Structured viva
Control of Local Blood	Identify the dynamics of local and peripheral Blood flow	• Distinguish between acute and chronic control of local blood flow. • Conceptualize active and reactive hyperemia • Relate the blood flow control to total peripheral resistance	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
Cardiac output and venous return	Analyze the factors regulating venous return and cardiac output at rest and during exercise.	• Understand the determinants of cardiac output and factors affecting cardiac output. • Appreciate the mechanics of low and high cardiac outputs along with their effects on heart. • Comprehend the factors affecting stroke volume, heart rate and total peripheral resistance. • List the functions of veins • Identify factors regulating venous return and significance of venous reservoirs. • Appreciate the equality of cardiac output and venous return.	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva

Arterial blood pressure	Summarize regulatory mechanisms of blood pressure & cardiac output control in health and disease	• Comprehend the determinants of arterial pressure, factors affecting and mechanisms regulating blood pressure on short- and long-term basis. • Recognize mean arterial pressure and its significance. • Comprehend the individual and integrative role of baroreceptors, chemoreceptor, volume receptors, arterial natriuretic factors and Renin-angiotensin - aldosterone system in regulation of arterial pressure. • Understand the characteristics of regional circulations (skeletal muscles, pulmonary, coronary & cerebral) and factors regulating thereof	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
Circulatory shock	Compare various types of shock and their pathophysiology	• Discriminate various types of shock, its types and stages of development • Differentiate between compensated and uncompensated shock. • Recognize the short term and long-term compensatory mechanisms in circulatory shock. • Diagnose and treat various types of shock based on clinical scenarios	LGIS	▪ MCQ ▪ SAQ/SEQ ▪ Structured viva
ECG	Interpret normal ECG	• Comprehend basis of ECG, different ECG Leads and their placements	LGIS	▪ MCQ ▪ SAQ/SEQ

		• Draw and label normal ECG showing various waves, segments and intervals • Understand significance of waves, segments and intervals of ECG • Calculation of heart rate and various intervals and segments • Appreciate relationship between vector and lead, type and locations of leads and principles for vector analysis in a normal heart		▪ Structured viva

Practicals/SGDs:

1. Record Interpret normal ECG by placing all the chest and limb leads on an SP
2. Examine the Radial Pulse and comment on rate, rhythm and character.
3. Examine the Heart Sound on Pulmonary, Aortic, Mitral and Tricuspid areas

BIOCHEMISTRY

Topic/ Theme	Learning outcomes	Learning Objectives/Contents	Instructional strategies	Assessment tool
Lipid chemistry & metabolism	Relate the significance of different lipids in medicine	• Definition, biomedical function, Classification of lipids • Glycolipids, Sphingolipids and their biochemical Significance • Fatty acids, chemistry, classification and biochemical function, Essential fatty acids • Mobilization & transportation of Fatty Acids • Beta oxidation over view • Steroids, sterol e.g. cholesterol, their chemistry & functions and clinical significance	Lectures SGD	• MCQ • SAQ/SEQ ▪ Structured viva

		• Over view of Ketogenesis and Ketolysis • Mechanism and utilization of Ketone bodies and significance • Over view of Cholesterol synthesis and Lipoprotein metabolism & clinical significance • To understand role of Obesity in CVDs • Define and explain Hypercholesterolemia in relation with the pathophysiology of atherosclerosis, Mediterranean diet		
Clinical Enzymology	Elaborate the biochemical importance of isoenzymes as well as their role in various clinical conditions	• Isoenzymes • Application of enzymes in clinical diagnostics and therapeutics • Describe the role of Troponins in Diagnosis of MI	Lectures SGD	• MCQ • SAQ/SEQ • Structured viva
Practicals: **Lipid profile by microlab**				

BLOCK II

Preamble: Block II advances your knowledge by focusing on how the body regulates, adapts, and develops throughout life. The modules here include the respiratory system, endocrinology and metabolism, growth and development, and the study of dental and periodontal tissues. Together, these subjects explore the body's remarkable ability to maintain balance, adapt to changing conditions, and support long-term growth. Respiratory physiology is essential for understanding oxygen delivery, which is crucial during dental procedures involving anesthesia and sedation. Endocrinology and metabolism highlight the body's regulatory system and chemical messengers that influence oral health — for example, the link between diabetes and periodontal disease. Growth and development give you the foundation for understanding craniofacial growth, occlusion, and orthodontics, all of which are highly relevant in dentistry.

This block also formally introduces you to dental and periodontal tissues, allowing you to explore their structure, function, and role in maintaining oral health. You will begin to connect systemic health with oral disease, understanding how conditions in one part of the body can influence outcomes in another. By completing Block II, you will gain a deeper understanding for the interconnectedness of body systems, and you will start to see dentistry not just as the care of teeth and gums, but as part of a broader healthcare context.

MODULE V - RESPIRATORY SYSTEM

Duration: 02 weeks

ANATOMY				
Topic/ Theme	**Learning Outcomes**	**Learning Objectives / Contents**	**Instructional Strategy**	**Assessment Tool**
	By the end of the module students will be able to:			
GROSS ANATOMY				
Thorax	Appraise the gross	• Describe the formation of thoracic apertures. • Trace the course of vagus nerve in thorax Skill • Identify cardiophrenic angle, hilar shadow and aortic knuckle on chest x ray.	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
	Correlate structural with clinical anatomy of diaphragm.	• Identify parts of diaphragm • List the apertures in diaphragm with their levels and structures passing through each • Analyze presentation of phrenic nerve lesions with anatomical reasoning • Justify anatomical basis of referred shoulder tip pain	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Mediastinum	Recognize divisions of mediastinum and their relations of clinical relevance	• Define mediastinum. • Enumerate the divisions of mediastinum. • Enlist the structures contained in different mediastina.		
Lungs	Appraise the anatomy of lungs and relevant clinical conditions	• Identify the borders, surfaces, and hilar apertures.		
PHYSIOLOGY				
RESPIRATORY AND HIGH ALTITUDE				

Topic	Learning Outcomes	Learning Objectives/Contents	Instructional Strategies	Assessment tools
Introduction to Respiratory System	• Correlate the anatomy of respiratory tract with its functions • Appreciate the role of conductive and gas exchange zones of lungs	• Recognize the functional anatomy of various parts of respiratory system • Highlight the non-respiratory functions of respiratory tract	LGIS	MCQ/SAQ/ structured viva
Pulmonary Mechanics	• Analyze the mechanics of respiration • Analyze lung volume and pressure changes during quiet and forceful breathing	• Distinguish functions of inspiratory and expiratory muscles during quiet and forceful respiration • Correlate normal lung volumes/ capacities to various pressures and volume changes during forceful respiration and changes in volume and capacities	LGIS	MCQ/SAQ/ structured viva
Pulmonary Compliance	Explain factors determining pulmonary compliance	• Discern lung and chest wall compliance • Identify composition & role of surfactant in alveolar surface tension • State concept of work of breathing	LGIS	MCQ/SAQ/ structured viva
Respiratory Membrane & Diffusion of Gases	Compare the different modes of gas transport in blood	• Appreciate the layers of respiratory membrane in detail • Appraise concept of diffusing capacity through respiratory membrane • Identify factors affecting gas diffusion through respiratory membrane	LGIS	MCQ/SAQ/ structured viva

Diffusion of gases & Oxygen transport		• State the mechanics of oxygen diffusion from alveoli to blood • Distinguish mechanism of oxygen transport in the arterial blood, tissue fluid and cell	LGIS	MCQ/SAQ/ structured viva
xygen transport & Dissociative curve		• Identify the role of Hb in oxygen transport • Analyze normal oxygen-hemoglobin dissociation curve by explaining factors that shift oxygen-hemoglobin dissociation curve to right and left	LGIS	MCQ/SAQ/ structured viva
Carbon dioxide transport		• Identify various chemical form in which C02 is transported in blood • Discern normal C02 dissociation curve explaining Bohr effect, haldane effect and chloride shift	LGIS	MCQ/SAQ/ structured viva
Hypoxia and cynosis		• Differentiate between hypoxia and cyanosis • Explain types of hypoxia and cyanosis • Describe menifestations of hypoxia and cynosis	LGIS	MCQ/SAQ/ structured viva

Nervous regulation of respiration	• Compare the chemical and neural regulation of respiration during rest and exercise • Correlate ventilation with perfusion in different lung zones	• State different group of neurons composing respiratory center • Review nervous control of inspiration and respiratory rhythm • Recognize the regulatory mechanism of hering-breuer inflation reflex	LGIS	MCQ/SAQ/ structured viva
Chemical regulation of respiration		• Appraise location, function and stimulation (by C02 and H+) of central chemosensitive area • Identify the role of peripheral chemoreceptors for control of respiration	LGIS	MCQ/SAQ/ structured viva
		• Determine the composite effects of PC02, pH, & P02 on alveolar ventilation		

acticals/SGDs:

1. Determination of Platelet count
2. Determination of Haemoglobin in the blood. (Sahili's method)
3. Determine Red cell indices

BIOCHEMISTRY

Topic/ Theme	Learning outcomes	Learning Objectives/Contents	Instructional strategies	Assessment tool
Biochemistry of body fluids	Demonstrate understanding of biochemistry of body fluids	• Ionization of water and weak acids and bases • Concept of pH and pH scale • Dissociation constant & titration curve of weak acids, the concept of pK values) • Distribution of body fluid • Water turn over and balance • Biomedical Importance of - Osmosis, Osmotic pressure, surface	• Lectures • SGD	• MCQ • SAQ/SEQ • Structured viva

		tension, viscosity & their importance related to body fluids		
Phospholipids	Appraise the chemistry of phospholipids and Relate the knowledge of phospholipids in respect to respiratory system	• Chemistry , structure and biomedical significance and structure of phospholipids		
Respiratory Proteins	Relate the knowledge of biochemical basis of respiratory proteins	• Chemistry & biomedical significance of respiratory proteins (alpha 1 anti trypsin)	• Lectures • SGD	• MCQ • SAQ/SEQ • Structured viva
Practicals: **Preparations of Solutions**				

MODULE VI - ENDOCRINOLOGY & METABOLISM

Duration: 04 weeks

ANATOMY				
Topic/ Theme	**Learning Outcomes**	**Learning Objectives / Contents**	**Instructional Strategy**	**Assessment Tool**
	By the end of the module students will be able to:			
GENERAL EMBRYOLOGY				
Development of skull	Comprehend the embryological basis behind the development of skull, correlate them with various relevant clinical presentations	• Identify the sources of skull • Classify Skull on embryological basis • Describe the events in development of cartilaginous and membranous neurocranium and viscerocranium • Outline features of a newborn skull. Identify the fontanelles with reference to their location, closing time and clinical significance • Explain the embryological basis of microcephaly and various types of craniosynostosis	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Gross (Head)				

Skull	Elucidate the topographic anatomy of skull	• Appreciate the general plan of studying skull from different views. • Identify important bony landmarks on the bones as viewed from lateral, superior, inferior, anterior and posterior views. • List structures traversing the foramina in these bones • Identify the bones forming the boundaries of orbit, nasal cavity. oral cavity, temporal, infratemporal fossa &pterygopalatine fossa on the given bone. (detail to be done with relevant topics)		
Scalp	Correlate the structure and neurovascular supply of scalp with anatomical basis of relevant clinical conditions.	Appraise extent of scalp on model Enumerate layers of scalp in a sequential order Correlate gross features of each layer with anatomical basis of black eye, profuse bleeding, gaping wound, spread of scalp infection and shape of hematoma		

Temporal & infratemporal region	Correlate the location, boundaries, and contents of temporal and Infratemporal fossa with relevant clinical conditions	• Identify the location, boundaries, contents and communications of temporal and infratemporal fossa on a given model and skull. • Describe the course and distribution of mandibular nerve from origin to distribution • Tabulate the attachments, actions and nerve supply of muscles of mastication. • Trace location, various routes and distribution of otic ganglion • Justify role of lateral pterygoid as a peripheral heart on anatomical basis of pterygoid venous plexus • Elucidate importance of pterygoid venous plexus in case of intracranial spread of infection to cavernous sinus. • Trace origin and distribution of superficial temporal, first and second parts of maxillary artery	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Pterygopalatine fossa	Describe the anatomy of Pterygopalatine fossa in relation with surrounding structures	• Identify the location of pterygopalatine fossa on skull • Enumerate the contents and communications • Describe the distribution of third part of maxillary artery, nerve and pterygopalatine ganglion • Justify the role of pterygopalatine ganglion in hay fever/allergies	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE

Nose and paranasal sinuses	Correlate the gross anatomy of Nose and paranasal sinuses with relevant clinical conditions	• Describe the skeletal framework of different walls of nose • Describe the features, vascular supply, nerve supply and openings in lateral wall of nose • Describe the features, vascular supply, nerve supply of medial wall of nose • Highlight the significance of little's area in a case of epistaxis • Trace the location and drainage of paranasal sinuses in skull and on radiograph	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Hard and soft Palate	Correlate the gross anatomy of hard and soft palate with their relevant clinical conditions	• Discuss the bony framework of hard palate. • Identify the gross features of hard palate and soft palate. • Identify muscles of soft palate on the model • Describe the attachments, nerve supply and actions of muscles of soft palate • Describe blood supply and nerve supply of soft palate • Identify the main muscles	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
		forming the palatoglossal and palatopharyngeal Arches		
Mandible	Elucidate the topographic anatomy of mandible	• Identify parts of mandible • Describe ramus and body of mandible with respect to its bony features and attachments.	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE

Submandibular region	Correlate the anatomy of Submandibular region with its clinical significance	• Revisit boundaries of submandibular triangle • Describe the parts, relations, neurovascular of submandibular gland. • Trace the routes of submandibular ganglion • Describe the distribution of submandibular ganglion • Correlate the anatomy of submandibular fascial space with Ludwig's angina	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
TMJ	Correlate the Gross anatomical features of temporo-mandibular joint with clinical significance	• Identify the type of TMJ. • Identify the articular surfaces of TMJ on a given model or dry bones. • Explain the attachments of capsule. • Name the ligaments of TMJ. • Describe the attachments and relations of ligaments of TMJ. • Describe the type and shape of articular disc. • Justify the presence of two joint cavities and types of movements occurring in each. • Describe the movements of jaw at TMJ with special reference to axis and	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
		muscles producing them. • Describe the clinical signs of anterior dislocation of TMJ and explain the steps of its reduction.		

Oral cavity	Correlate the gross anatomy of oral cavity and tongue with anatomical basis of relevant clinical conditions	• Name different boundaries of oral cavity. • Describe blood and nerve supply and lymphatic drainage of oral cavity. • Identify the location of inferior alveolar nerve block • Describe the salient features of floor of mouth. • Discuss the attachments, actions, nerve supply and relations of suprahyoid muscles • Identify parts of tongue • Identify the gross features of dorsal and ventral surfaces of tongue • Name the intrinsic and extrinsic muscles of tongue. • Describe attachments, actions and nerve supply of muscles of tongue • Describe the motor, general and special sensory innervation of tongue	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Pharynx	Correlate the gross anatomy of pharynx with relevant clinical conditions	• Differentiate extent, anatomical features, vascular supply, nerve supply of three parts of pharynx on anatomical basis • List muscles of pharynx	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
PHYSIOLOGY				
ENDOCRINOLOGY				
Module/ Topics	**Learning Outcomes**	**Learning Objectives/Contents**	**Instructional Strategies**	**Assessment tools**

Basics of endocrinology & Mechanism of action of hormones	Appraise the mechanisms of action of hormones	• Identify the various hormone receptors and their activation • Explain the mechanism of intracellular signaling after hormone receptor activation • Explain the second messenger mechanisms for mediating intracellular hormonal functions • Identify the hormones that act mainly on the genetic machinery of the cell	LGIS	MCQ/SAQ/SEQ/ structured Viva
Hormones of hypothalamus and Pituitary gland		• Explain the pituitary gland and its relation to the hypothalamus • Summarize the hypothalamic-hypophysial portal blood vessels of the anterior pituitary gland and its significance	LGIS	MCQ/SAQ/SEQ/ structured Viva
		• Recall the functions and regulation of growth hormone • Differentiate between hypopituitarism and hyperpituitarism and its pathophysiological basis • Explain the posterior pituitary gland and its relation to the hypothalamus • Describe the physiological functions of ADH and oxytocin Hormone	LGIS	MCQ/SAQ/SEQ/ structured Viva

Thyroid gland		• Recall the synthesis and secretion of the thyroid hormone • Explain the functions of the thyroid hormone • Summarize the regulation of thyroid hormone secretion • Identify the disorders of the Thyroid gland and their pathophysiological basis	LGIS	MCQ/SAQ/SEQ/ structured Viva
Calcium regulating hormones		• Explain the regulation of calcium and phosphate in the extracellular fluid and plasma • Enlist the actions of vitamin D • Explain the effect of parathyroid hormone on calcium and phosphate concentrations in the extracellular fluid • Summarize the control of parathyroid secretion by calcium ion concentration • Describe the actions of calcitonin • Explain the pathophysiology of parathyroid hormone, vitamin D, and bone diseases	LGIS	MCQ/SAQ/SEQ/ structured Viva
Hormones of adrenal cortex	Appraise the mechanisms of action of hormones	• Explain synthesis and secretion of adrenocortical hormones • Enlist the functions of aldosterone • Enlist functions of the glucocorticoids • Describe the disorders of adrenocortical secretion and their	LGIS	MCQ/SAQ/SEQ/ structured Viva

		pathophysiological basis		
Pancreas	Give pathophysiological basis of glucose regulation	• Explain glucose metabolism with its regulation	LGIS	MCQ/SAQ/SEQ/ structured Viva
Practicals/SGDs: 1. Estimate haematocrit (PCV) 2. Estimate ESR by Westergren method 3. Determine ABO Rh blood groups.				
BIOCHEMISTRY				
Topic/ Theme	**Learning outcomes**	**Learning Objectives/Contents**	**Instructional strategies**	**Assessment tool**
Nucleotides	Relate the knowledge of chemistry and metabolism of nucleotide in health and disease	• Nucleic acids, their types, structure and functions • Chemistry and structure of nucleotides and their biochemical role • Nucleotides derivatives and their biochemical role	• Lectures • SGD	• MCQ • SAQ/SEQ • Structured viva
Cancer and tumor markers	Apply the basic knowledge of biochemistry for understanding cancer and biochemical changes in cancer cells	• Biomedical importance • Fundamental features of carcinogenesis • Oncogenes and tumor suppressor genes and key role in carcinogenesis • Tumor biomarkers		
Neurotransmitters	Relate the importance of various neurotransmitters to its clinical significance	• Write a note on Catecholamines, their chemistry, synthesis and degradation, biochemical role • Explain role of Acetyl choline, Dopamine, Serotonin and Histamine, Glutamate , GABA & NO		

Eicosanoids Metabolism	Apply the knowledge of eicosanoids for understanding its role in inflammation	• Introduction and function of eicosanoids and related clinical significance	• Lectures • SGD	• MCQ • SAQ/SEQ • Structured viva
Aging & free radicals	Apply the basic knowledge of biochemistry for understanding aging and its biochemical changes	• Different reactive oxygen species(ROS) produced by the human body • Mechanism of production of reactive oxygen species(ROS)Effect of ROS on health and disease • Mechanism of Scavenging of ROS • Biochemical role of antioxidant (Vit E, Vit C, Glutathione , Lipoic acid , CoQ10 and NADPH)		

MODULE VII - CRANIOFACIAL (SPECIAL SENSES)

Duration: 04 weeks

ANATOMY				
Topic/ Theme	**Learning Outcomes**	**Learning Objectives / Contents**	**Instructional Strategy**	**Assessment Tool**
	By the end of the module students will be able to:			
Gross Anatomy (Neck)				
Cervical vertebrae		• Differentiate typical and atypical cervical vertebrae Give distinguishing features of each cervical vertebra. • Enumerate structures passing through foramina • Outline ligamentous attachments on cervical vertebrae	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Joints of neck	Correlate the gross anatomical features of joints of neck with their clinical significance	• Name the typical and atypical intervertebral joints of neck. • Identify the types of atlanto- occipital and atlanto-axial joints. • Describe the movements of these joints with muscles producing them	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE

Face	Correlate the gross anatomy of face with anatomical basis of relevant clinical conditions	• Outline the characteristic features of facial skin. • Elucidate the cutaneous innervation of face • Group facial muscles according to the orifices they are guarding • Describe the nerve supply of muscles of facial expressions. • Describe the course of arteries, veins, lymphatics and nerves of the face with the help of model. • Correlate gross features	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
		of face with anatomical basis of danger area, trigeminal neuralgia, Bell's palsy. **Skills** • Identify muscles of facial expressions Illustrate the cutaneous innervation of face		
Mandibular and maxillary branches of Trigeminal nerve	Correlate the anatomy of mandibular and maxillary divisions of Trigeminal nerve with their lesions	• Describe the pathway of mandibular nerve from nucleus to target organs • Describe the pathway of maxillary nerve from nucleus to target organs. • Describe the lesion of nerves with special reference to infections of molar teeth.	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE

Facial nerve	Correlate the anatomy of facial nerve with its lesions	• Revisit the course and distribution of facial nerve • Revisit the relationship of facial nerve with pterygopalatine and submandibular ganglia • Revisit the effects of lesion of facial nerve at different levels • Differentiate anatomical basis of clinical presentation of UMN and LMN lesion of facial nerve.	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Parotid region	Correlate the anatomy of parotid region with its clinical significance	• Trace the pathway of autonomic supply of parotid gland. • Enumerate structures embedded in parotid gland in a sequential order. • Analyze anatomical basis of clinical presentation of mumps. • Correlate the extra cranial course of facial nerve with Bell's palsy.	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Deep cervical Fascia	• Anatomize the four layers of deep cervical fascia in detail. • Correlate the topography of cervical fascial spaces to mediastinal and contralateral spread of infection.	• Enumerate the layers of deep cervical fascia. • Trace the attachments of investing, pre-tracheal, carotid sheath and prevertebral layers of fascia. • Identify various modifications and neck spaces formed by fascial attachments. • Comprehend the clinical importance of neck spaces in spread of infection	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE

Prevertebral region and root of the neck	Describe skin, superficial fascia, and cutaneous nerves of the prevertebral region along with the action and nerve supply of muscles present here	• Enumerate the prevertebral muscles • Describe origin, insertion, action and nerve supply of prevertebral muscles • Identify the boundaries of pyramidal space. • Describe the peculiar arrangement of prevertebral fascia in prevertebral region and justify formation of axillary sheath around axillary artery and brachial plexus but not axillary vein. • Anatomize the relations of key muscle of root of neck (scalenus anterior) • Describe the parts and branches of subclavian artery.	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Back of the neck	Link the anatomical location and contents of	• Enumerate the muscles of back of neck. • Identify the boundaries	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva
	triangles present at the back of neck with their clinical significance	and contents of suboccipital triangle. • Describe the course and relations of 3rd and 4th parts of vertebral arteries.		▪ OSPE
Muscles of the neck	Describe the origin, insertion, movements, and nerve supply of the muscles present in neck	• Describe the muscles of neck (sternocleidomastoid, trapezius and infrahyoid muscles) along with their nerve supply with the help of models. • Enlist the features of Torticollis	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE

Triangles of neck	Link the anatomical location of triangles of neck and their contents with their clinical significance	• Tabulate the attachments, nerve supply, actions of superficial and deep muscles of neck (sternocleidomastoid, suprahyoid, infrahyoid, sub occipital, prevertebral muscles,). • Identify boundaries and contents of triangles of neck on model • Describe the origin, course and distribution of nerves of neck (cervical plexus, Ansa cervicalis, Common carotid artery, Internal jugular vein, subclavian vessels)	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Vessels of neck	Correlate the anatomy of each vessel with its area of supply and drainage	• Enumerate the main vessels in neck. • Describe the course and branches of - External carotid artery - Subclavian artery - External jugular vein - Internal jugular vein	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Nerves of neck	Correlate the anatomy and distribution of cranial nerves with lesions associated with their injuries	• Enumerate the main cranial nerves supplying in neck • Trace the distribution of cranial nerves • Enumerate branches of each of the above nerve and identify their area of supply.	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE

Viscera of neck	Correlate the anatomy of viscera's present in neck with their relevant clinical significance	• Appraise the relations of trachea and esophagus in neck region with the help of dissection • Describe the structures involved in cricothyroidotomy and Tracheostomy with the help of dissection	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Thyroid and parathyroid	Correlate the gross anatomy of thyroid and parathyroid glands with relevant clinical conditions	• Identify gross features of thyroid and parathyroid glands on models. • Describe capsule, relations and blood supply of thyroid and parathyroid • gland • Justify anatomical basis of movement of thyroid gland during deglutition • Discuss surgical precautions in thyroid surgery while ligating vessels and enucleation	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Larynx	Correlate the gross anatomy of larynx with relevant clinical conditions	• Describe laryngeal wall in detail with emphasis on cartilages, ligaments, muscles, vascular supply and nerve supply. • Analyze mechanism of abduction and adduction of vocal cords • Distinguish clinical	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
		presentations of injury to external, internal and • recurrent laryngeal nerves		

Lymphatic drainage of the head and neck	Appraise the lymphatic drainage of neck with understanding of relevant clinical conditions on anatomical basis	• Enlist the groups of lymph nodes of neck. • Describe their location and areas of drainage • Appraise the formation of jugular lymph trunk • Correlate the clinical importance of lymphatic drainage of head and neck	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Orbit	Correlate the anatomy of orbital contents with relevant clinical significance	• Describe the skeletal framework of bony orbit and its communications • List the contents of orbit • Identify the parts of eyeball on a model • Tabulate the attachments, nerve supply and actions of extraocular muscles • Justify the movements of extraocular muscles based on their attachments • Trace the course and distribution of III, IV and VI Cranial Nerves • Justify the peculiar Position of eyeball in case of lesion of III, IV and VI Cranial Nerves • Trace the route and distribution of ciliary ganglion. • Describe the course and distribution of ophthalmic nerve • Describe the nerve supply of Lacrimal gland	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE

Lacrimal apparatus	Correlate the anatomy of lacrimal apparatus with elevant clinical significance	• Enumerate the structures forming lacrimal apparatus • Describe the nerve supply of lacrimal apparatus • Correlate the anatomical structures of lacrimal apparatus with the features of blocked Lacrimal duct	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE
Ear	Correlate the gross anatomy of ear with relevant clinical conditions	• Describe the gross anatomical features, boundaries, structures and contents of middle ear cavity. • Describe the structures forming the walls of middle ear cavity on the given model. • Highlight the importance of infection in middle ear cavity in relation to its communications. • Trace the pathway and distribution of facial nerve within petrous part of temporal bone.	▪ Lectures ▪ SGD	▪ MCQ/ SEQ ▪ Viva ▪ OSPE

PHYSIOLOGY				
Craniofacial (Special Senses)				
Module/ Topics	**Learning Outcomes**	**Learning Objectives/Contents**	**Instructional Strategies**	**Assessment tools**
Physiology of Eye	Explain the physiology of optical system of eye and understand errors of refraction	Explain refraction and concept of convergence and divergence. Define focal length, focal point and power of lens. Differentiate between emmetropia, myopia, hyperopia, astigmatism, presbyopia and describe their treatment	**LGIS** • CBL • Practical demonstration and performance	MCQ/SAQ/SEQ/ structured Viva/OSPE

	Correlate physiological anatomy of retina with its neural functions	• Explain physiological anatomy of retina • Discuss photochemistry of vision • Explain visual pathways and accommodation reflex pathways	**LGIS** • CBL • Practical demonstration and performance	MCQ/SAQ/ SEQ/ structured Viva/OSPE
Physiology of Ear	Explain the physiology middle ear	Describe the physiological Anatomy of ear Explain the mechanism of conduction of sound waves through the ear to the cochlea Describe "Impedance Matching" and its importance Describe the process of attenuation of sounds	LGIS	MCQ/SAQ/ SEQ/ structured Viva/OSPE
Physiology of taste	Explain the physiology of taste sensation and its pathway	Describe the primary sensations of taste Describe the mechanism of stimulation of taste buds and the transmission of signals to CNS	**LGIS** • CBL • Practical demonstration and performance	MCQ/SAQ/ SEQ/ structured Viva/OSPE
Physiology of olfaction	Explain the physiology of olfaction and its pathway.	Explain the physiological anatomy of olfactory membrane. Explain the mechanism of stimulation of olfactory cells. Identify the primary sensations of smell	LGIS CBL	MCQ/SAQ/ SEQ/ structured Viva
		Describe the transmission of signals of olfaction into the central nervous system		

Practicals/SGDs:

1. Estimate bleeding clotting time.
2. Determination of DLC.

BIOCHEMISTRY

Topic/ Theme	Learning outcomes	Learning Objectives/Contents	Instructional strategies	Assessment tool
Protein Chemistry & Metabolism	Relate the significance of different proteins in medicine	• Definitions, Biomedical importance and classification of proteins based on: • Physiochemical properties • Functional properties	Lectures SGD	MCQ SAQ/SEQ Structured viva

		• Nutritional properties • Amino acids, their structure, properties and functions • Classification and nutritional significance of amino acids • Structure of proteins and their significance • Immunoglobulins and their biomedical significance • Plasma proteins & their clinical significance • Amino acid oxidation, transamination, deamination, decarboxylation, deamidation and transamination • Transport of Ammonia • Ammonia intoxication • Urea cycle		
Practicals: Color reactions of proteins I, Ninhydrin test, Biuret test, Color reactions of proteins II, Xanthoproteic test, Aldehdye test, Millon Nasse Test Color reactions of proteins III, Sulphur Test				

BLOCK-III

Preamble: Block III brings together complex systems that control the brain, body, and essential homeostatic processes. The modules include neuroscience, renal physiology, digestive and metabolic processes, and craniofacial structures. This block requires you to integrate what you have learned in Blocks I and II and apply it to higher-order functions and anatomy that directly relate to dental practice. The neuroscience module will introduce you to the structure and function of the nervous system, including sensory and motor pathways. This is particularly important for dentists, as you will learn the basis of pain perception, anesthesia, and motor control of facial muscles. Understanding the nervous system provides insight into why patients experience pain, fear, or numbness, and how you as a dentist can manage these experiences.

The renal and digestive systems will deepen your knowledge of metabolism, fluid balance, and nutrition — all of which have direct consequences for oral health and healing. Finally, the craniofacial structures module serves as a direct bridge between basic sciences and clinical dentistry, equipping you with the anatomical and developmental knowledge required for oral surgery, prosthodontics, and orthodontics in later years. Block III is the culmination of your first year, tying together the scientific principles you have studied and preparing you for clinical exposure in subsequent years. By mastering the content in this block, you will be ready to transition from theory to application in later years, building the confidence and competence needed for your professional development.

MODULE VIII - DIGESTIVE SYSTEM & METABOLISM

Duration: 02 weeks

ANATOMY				
Topic/ Theme	**Learning Outcomes**	**Learning Objectives / Contents**	**Instructional Strategy**	**Assessment Tool**
	By the end of the module students will be able to:			
Digestive system and Metabolism				
HISTOLOGY				
GIT (lip, **Tongue, esophagus,** **and salivary glands**	Appraise the light microscopic structure of lip and tongue, with special emphasis on Papillae of tongue and taste buds. Appraise the light microscopic structure of major salivary glands	**Knowledge** • Explain the histological structure of lip. • Describe the microscopic structure of tongue, with special reference to epithelium on its two surfaces, types of lingual papillae and taste buds with their location and structure • Describe the Histological features of parotid, submandibular and sublingual glands with reference to their type, parenchyma, stroma and duct system. • Describe the histological structure of esophagus. **Skills** • Identify microscopic sections of lip, tongue, submandibular, sublingual and parotid glands and esophagus under light microscope and enlist at least two identification points of each. • Draw labelled diagrams showing light microscopic structure of lip, tongue, submandibular, sublingual and parotid glands	LGIS / SGD	MCQ/SAQ/ OSPE/ structured viva

Gross (GIT)				
GIT		• Identify abdominal lines and planes dividing the abdomen into its quadrants. • Enlist the structures in each quadrant • Outline of gross features of stomach, small intestine, colon rectum and anal canal. • Enlist the blood vessels that supply gut. • Describe the formation and distribution of portal vein.		
Hepatobiliary system		• Describe location, lobes, coverings and ligaments of liver. • Describe dual blood supply of the liver. • Learn the components of the biliary apparatus and trace the drainage of bile from liver to duodenum.	LGIS / SGD	MCQ/SAQ/ OSPE/ structured viva
PHYSIOLOGY				
GIT				
Topic/ Theme	**Learning outcomes**	**Learning objectives/content**	**Instructional strategies**	**Assessment tool**
Neural control of GIT	Analyze the interplay of autonomic and enteric nervous system in GI motility	• Appraise physiologic anatomy of gastrointestinal tract with specific focus on role of interstitial cells of Cajal • Compare functions of mesenteric and myenteric plexuses • Link the role of autonomic nervous system in GI motility	LGIS / SGD	MCQ/SAQ/ structured viva

Food Processing in oral cavity	Correlate the Pathophysiology of Mastication and deglutition with specified clinical presentations	• Recognize the role of teeth, tongue, cheeks and saliva in assimilation and digestion of food. • Distinguish three phases of deglutition reflex	LGIS	MCQ/SAQ/ structured viva
		• Outline different types of peristalsis in esophagus are taking place		
Vomiting reflex	Describe mechanism (stimuli, pathways, center) and clinical significance of vomiting reflex	• Explain the mechanism of vomiting reflex • Appraise the location and function of vomiting center/ chemoreceptor trigger zone in the brain	LGIS	MCQ/SAQ/ structured viva
Liver	To analyze the non-metabolic functions of liver	• Explain the role of liver in non-metabolic domains and give clinical importance of each	LGIS	MCQ/SAQ/ Structured viva
Food processing in stomach	Correlate structure with function of stomach	• Describe motor function of stomach • Recognize role of gastric secretions in the process of digestion • Explain factors which regulate stomach emptying	LGIS	MCQ/SAQ/ Structured viva
Secretory functions of alimentary canal	Correlate secretions of small intestine and colon with functions	• Explain role of pancreatic and biliary secretion in process of digestion • Correlate secretions of small intestine and colon with functions • Give absorption of various nutrients in small and large intestine	LGIS	MCQ/SAQ/ Structured viva
Practicals/SGDs: 1. Perform Deep Tendon reflexes 2. Perform Superficial reflexes on an SP				

BIOCHEMISTRY				
Theme/topic	**Learning outcomes**	**Learning objectives/content**	**Teaching strategy**	**Assessment tool**
Biochemistry of GIT	Relate the knowledge of biochemistry of GIT to different clinical scenarios	• Overview of digestion and absorption of Lipids, Carbohydrates, Proteins, nucleic acids. Nucleotides and neuclosides • Introduction, composition, functions, secretion, stimulants and depressants of: - - Saliva - Gastric juice - Bile - Pancreatic juice • Succus entericus	• Lectures • SGD • PBL • CBL	MCQ/ • SAQ/SEQ
Nutrition	• Appraise the nutritional requirements of each food constituent for better understanding of relevant disorders • Outline nutritional requirement in different commonly occurring disorders Review hazards of under and over nutrition	• Balanced Diet, DRIs (EAR, RDA, AI, UL), AMDR • Proteins (Protein turnover, Amino acid Pool, Nitrogen Balance, Protein Quality, Protein Requirement • Biomedical importance, • requirements of dietary Carbohydrates, Proteins and Lipids • Glycemic Index • Protein-Energy Malnutrition (Kwashiorkor, arasmus)	• Lectures • SGD • PBL • CBL	MCQ/ SAQ/SEQ
Carbohydrate Chemistry & Metabolism	Relate the significance of different	• Definition, biochemical functions and classification	Lectures • SGD	MCQ

	carbohydrates in medicine	• The biomedical importance of carbohydrates • Structure and functions of Monosaccharides, and their derivatives • Disaccharides - their important examples • Oligosaccharides-their combination with other macromolecules • Polysaccharides- their important examples and biochemical role • Overview (Introduction & biomedical importance) of major Metabolic pathways (Glycolysis, TCA cycle, Gluconeogenesis Glycogen metabolism, HMP shunt) and hormonal regulation (Insulin, Glucagon) • Glycolysis (Phases and reactions of Glycolysis) & Energetics of Aerobic and Anaerobic glycolysis • The fate of Pyruvate • The Citric Acid Cycle Reactions, energetics of Citric acid cycle • Gluconeogenesis Important three by-pass reactions		SAQ/SEQ Structured viva

Practicals:

Molish's test
Saliwanoff s test and Rapid furfural test
Benedict s qualitative test
Fehling's Test
Iodine Test
Estimation of blood glucose by micro lab

MODULE IX - RENAL SYSTEM

Duration: 02 weeks

ANATOMY				
Topic/ Theme	**Learning Outcomes**	**Learning Objectives / Contents**	**Instructional Strategy**	**Assessment Tool**
	By the end of the module students will be able to:			
Gross Anatomy				
\Renal system	Comprehend the topographical anatomy of renal system.	• Describe the gross features of kidney, relations, and its coverings Skill • Identify the impressions of surrounding structures on both kidneys in the given model	LGIS/ SGD	MCQ/SAQ/ structured viva / OSPE
PHYSIOLOGY				
RENAL				
Edema	Elucidate edema types, clinical significance and factors responsible for causing edema	• Explain TBW content and its distribution in different body compartments • Give composition of ICF and ECF • Analyze the role of starling forces and other safety factors (lymphatics, negative ISF pressure) in prevention of edema.	LGIS	MCQ/SAQ/structured viva
Functional anatomy of kidney	Recognize functions of kidneys.	• Outline the physiological anatomy of nephron and glomerular capillary membrane • List primary and endocrinal functions of kidney • Physiology of micturition reflex	LGIS	MCQ/SAQ/structured viva

Glomerular Filtration	Analyze the process of formation of	• Relate the determinants of GFR to clinical conditions.	LGIS	MCQ/SAQ/structured viva
	glomerular filtrate and its regulation	• Identify the parameters involved in autoregulation of GFR and blood flow. • Explain renal tubular reabsorption and secretion • Discuss effects of arterial pressure on urine output (pressure nutriuresis, pressure diuresis and renin angiotensin system) • Discuss renal function test		
Practicals/SGDs: Record the normal body temperature				
BIOCHEMISTRY				
Theme/topic	**Learning outcomes**	**Learning objectives/content**	**Teaching strategy**	**Assessment tool**
Nucleotides	Relate the knowledge of chemistry and metabolism of nucleotide in health and disease	• Nucleic acids, their types, structure and functions • Chemistry and structure of nucleotides and their biochemical role • Nucleotides derivatives and their biochemical role	• Lectures • SGD	• MCQ • SAQ/SEQ • Structured viva

Acid Base balance	Demonstrate understanding of biochemistry of pH of body fluids	• Ionization of water and weak acids and bases • Concept of pH and pH scale • Dissociation constant & titration curve of weak acids, the concept of pK values • Buffers, their mechanism of action • Henderson-Hesselbalch Equation (No derivation) • Electrolyte balance • Metabolism of electrolytes	• Lectures • SGD	• MCQ • SAQ/SEQ • Structured viva
		• Production of acids by the body • Production of bases by the body • Maintenance of blood pH by blood buffer, respiratory mechanism & renal mechanism • Disorders of Acid base balance		
Practicals: Normal Organic constituents of urine Abnormal Organic constituents in urine Abnormal Inorganic constituents in urine (serum electrolyte analyzer) Preparation of urine report				

MODULE X - NEUROSCIENCES & NUTRITION

Duration: 06 weeks

Topic/ Theme	Learning Outcomes	Learning Objectives / Contents	Instructional Strategy	Assessment Tool
	By the end of the module students will be able to:			
GROSS ANATOMY				
Nervous system-I	Correlate the general anatomical structure of different parts of nervous system, with its functional significance	Appraise general concept of nervous system. • Nervous Tissue • Receptors • Nerve fiber • Neuroglia Identify the parts of the nervous system contributing information of central and peripheral nervous system Describe the formation, course and distribution of a typical spinal nerve	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva
Nervous system-II	Appraise the basic organization of the main structures that form nervous system	• Define the grey matter, white matter, ganglion, nucleus and nerve. • Appraise a three-dimensional appreciation of the parts of the brain and their relative positions to one another • Outline the anatomical organization of autonomic nervous system		
Embryology				
CNS	Comprehend the embryological basis behind formation of different components of nervous system and correlate them with various	• Explain the development of spinal cord. • Describe the positional changes of the cord. • Explain the causes of neural tube defects • Enlist various variants of spina bifida. • Explain the process of		

	relevant clinical presentations	development of various variants of spina bifida		
		• Summarize primary and secondary brain vesicles with their derivatives • Discuss birth defects associated with defective development of neural tube		
Gross Neuroanatomy				
Anatomy of cranial cavity	Appraise the gross features of cranial cavity and the structures contained within it to understand the anatomical basis of clinical conditions related to them.	• Describe and demonstrate the boundaries and gross features of cranial fossae. • Enlist and demonstrate foramina along with structures passing through them in anterior, middle and posterior cranial fossae. • Recognize and demonstrate the important sutures, fontanelle and impressions on the interior of cranial vault.	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva

Gross Anatomy of Spinal cord	Correlate the position and functions of the main nervous pathways and nerve cell groups in the spinal cord, with associated segmental injuries and diseases.	• Explain the gross appearance and the nerve cell groups in the anterior, posterior and lateral gray columns of spinal cord • Enumerate and illustrate the arrangements of ascending and descending tracts (white matter) in spinal cord at various levels. • Explain the given clinical conditions related to ascending and descending tracts of spinal cord. • Trace following pathways of superficial and deep sensations indicating the location of first, second and third order neurons. • Pain and temperature pathways • Light touch and pressure pathways • Discriminative touch, vibratory sense and conscious muscle joint sense. • -Muscle joint sense pathways to the cerebellum • Posterior spinocerebellar tract • Anterior spinocerebellar tract • Trace following pathways of voluntary movements indicating the location of first, second and third order neurons. • Cortico spinal tracts	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva

Gross anatomy of the brainstem	Appraise the anatomy of brainstem to assess the signs and symptoms presented by the patient in identifying the exact location of a structural lesion.	• Describe the gross appearance and internal structure of the medulla oblongata. • Illustrate the cross sections of medulla oblongata at different levels. • Apply the knowledge of neuroanatomy to explain the following clinical conditions: - Arnold-chiari malformation - Medial medullary syndrome - Lateral medullary syndrome - Wallenberg syndrome • Describe the gross features and internal structure of pons. • Illustrate cross section of pons at different levels showing major structures at each level. • Analyze the anatomical structures involved in pontine hemorrhage and infarction of pons. • Describe the gross appearance, internal structure of mid brain. • Illustrate cross section of midbrain at the levels of superior colliculus and inferior colliculus showing major structures at each level.	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva
		• Justify the lesions of midbrain structures by the blockage of cerebral aqueduct. • Identify the gross features of medulla, midbrain and pons on a given model.		

Gross anatomy of cerebellum and its connections	Outline the structure, function and connections of the cerebellum with the remainder of the central nervous system to understand the anatomical basis of cerebellar dysfunctions.	• Briefly demonstrate the gross features and phylogenetic divisions of cerebellum. • Enumerate afferent and efferent fibers of superior, middle and inferior cerebellar peduncles. • List intracerebellar nuclei and types of fibers constituting white matter of cerebellum and. • List disturbances of voluntary movements, reflexes, ocular movements, speech, posture and gait resulting due to lesions of cerebellum. Demonstrate different parts of cerebellum on given model.	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva
Gross anatomy of cerebrum	Appraise the structure, function and connections of the cerebrum with the remainder of the central nervous system to understand the anatomical basis of associated clinical conditions	• Describe the topographic anatomy of diencephalon and demonstrate its gross features on a given model. • Enlist main sulci and gyri of cerebral hemispheres and describe the extent of each of them. • Explain the divisions of cerebral lobes on superolateral, medial and inferior surfaces of cerebral hemispheres. • Enumerate fibers making up the white matter of cerebral hemispheres and describe each of them (Summarize parts, relations & fibers forming Internal capsule).	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva

		• Mark main sulci and gyri on lobes of cerebral hemispheres. • Identify commissural, projection and association fibers on brain prosected specimen • Describe and demonstrate the cortical functional areas in different lobes of cerebral hemispheres. • Enumerate types of aphasia and describe the lesions of speech areas responsible for producing aphasia. • Explain the effects of lesion in the primary and secondary visual cortex. • Illustrate the lateral and medial views of cerebral hemispheres showing motor and sensory areas.		
Gross anatomy of reticular formation and limbic system	Correlate the structure and function of the reticular formation and parts of the limbic system with associated clinical conditions.	• Outline the general arrangement and functions of reticular formation. • Enumerate components of limbic system and explain hippocampal formation with reference to its afferent and efferent connections. • Identify different components of limbic system on given model.	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva
Gross anatomy of basal nuclei	Recognize the location, connections and functions of basal nuclei to explain its common relevant diseases	• List terminology commonly used to describe the basal nuclei. • Outline Parkinson disease regarding etiology, characteristics signs and symptoms, types and treatment • identify different components of basal ganglia on given model/specimen	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva

Gross anatomy of cranial nerves	Appraise the location and connections of motor and sensory nuclei of the cranial nerves to identify the correct site of relevant cranial nerve lesions.	• Enumerate the cranial nerves and classify them into sensory, motor and mixed nerves. • Describe the nuclei and intracranial course of all cranial nerves. • Apply the knowledge of neuroanatomy to explain the clinical conditions regarding the lesions of various cranial nerves. • Identify different cranial nerves on given model/specimen	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva
Gross anatomy of thalamus, hypothalamus and their connections	Appraise the structure, function and connections of the thalamus and Hypothalamus with the remainder of the central nervous system to understand the anatomical basis of associated clinical conditions.	• Describe the divisions, nuclei and connections of thalamus. • Summarize the connections of hypothalamus with the pituitary gland. • Enlist the functions of main hypothalamic nuclei.	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva
Gross anatomy of Meninges and dural venous sinuses of brain and spinal cord	Appraise the arrangement of the meninges of brain and spinal cord to identify different types of cerebral hemorrhages.	• Define meninges of brain and describe the Dural reflections in brain. • Explain the meninges of spinal cord • Enumerate the nerves and blood vessels supplying the meninges. • Differentiate among different varieties of intracranial hemorrhages. • Demonstrate the supratentorial and Infratentorial compartments of tentorium cerebelli in a prosected specimen. • Define and enumerate paired and unpaired Dural venous	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva

		sinuses along with their attachments. • Describe the location, important relations, communications of cavernous sinus and enumerate • structures passing through it.		
Gross anatomy of ventricular system, CSF, Blood brain barriers	Appraise the anatomical organization of ventricular system, CSF, Blood brain & blood-CSF barriers to explain the relevant clinical scenarios	• Describe the anatomical organization of ventricular system and boundaries of third ventricle and choroidal plexus of each ventricle. • Define arachnoid villous and outline the role of arachnoid villi in absorption of CSF. • Outline the formation of different barriers of brain. • Summarize the floor of fourth ventricle.	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva
Gross anatomy of ventricular system, CSF, Blood brain barriers	Appraise the anatomical organization of ventricular system, CSF, Blood brain & blood-CSF barriers to explain the relevant clinical scenarios	• Describe the anatomical organization of ventricular system and boundaries of third ventricle and choroidal plexus of each ventricle. • Define arachnoid villous and outline the role of arachnoid villi in absorption of CSF. • Outline the formation of different barriers of brain. • Summarize the floor of fourth ventricle.	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva
Blood supply of the brain and spinal cord	Outline the blood supply of the brain and spinal cord	• Recognize the blood supply of different parts of brain and spinal cord. • Outline the formation and importance of veins of brain. • Enumerate the vessels taking part in formation of circle of Willis with its importance. • Relate the interruption of cerebral circulation of cerebral artery syndromes due to anterior, middle and posterior	LGIS/ SGD	• MCQ • SAQ/SEQ • Structured Viva

		cerebral artery occlusion. • Illustrate circle of Willis.		
Neurosciences				
Topic/ Theme	**Learning outcomes**	**Learning Objectives/Contents**	**Instructional strategies**	**Assessment tool**
Sensory receptors & receptor Potential	Interpret the physiological mechanisms controlling the functions of sensory system**.**	• Classify the various types of sensory receptors. • Explain the sensory stimuli and differential sensitivity of receptors. • Explain the sensory transduction into nerve impulses. • Describe the local electrical currents at nerve endings—receptor potentials, adaptation of receptors • Classify the nerve fibers that transmit different types of signals on the physiological basis. • Describe the transmission of signals of different intensity in nerve tract (spatial and temporal summation)	LGIS	• MCQ • SAQ/SEQ • Structured Viva
Sensory tracts and cortex	Explain the dorsal column medial lemniscal system and anterolateral pathways	• Identify the sensations carried by different sensory tracts • Differentiate between different sensory tracts • Describe the somatosensory cortex and somatosensory association areas • Explain the various thermal sensations, thermal receptors and their excitation and transmission of thermal signals in the nervous system	LGIS	• MCQ • SAQ/SEQ • Structured Viva

Brain analgesia system	Correlate the pathophysiological basis of pain pathways to their clinical significance	• Classify the different types of pain. • Compare and contrast the perception and transmission of the different types of pain. • Explain the pain suppression system in the brain and spinal cord. • Describe the brain's opiate system—endorphins and enkephalins. • Describe the clinical abnormalities of pain and other somatic sensations • Explain pathophysiological significance of referred and visceral pain	LGIS	• MCQ • SAQ/SEQ • Structured Viva
Motor system / Spindle / stretch reflex	Interpret the physiological mechanisms controlling the functions of motor system and higher mental functions.	• Relate the organization of grey and white matter in spinal cord to the pathophysiology of various spinal cord injuries. • Explain the role of proprioceptors (muscle spindles and Golgi tendon organs) in motor movements • Explain stretc. reflex • Describe the flexor reflex and the crossed extensor reflex. • Explain the reciprocal inhibition and reciprocal innervation. • Identify the reflexes of posture and locomotion in the spinal cord.	LGIS	• MCQ • SAQ/SEQ • Structured Viva
	Correlate functions and abnormalities of basal ganglia and cerebellum	• Explain physiological anatomy or cerebellum and basal ganglia • Explain significance of basal ganglia and cerebellum in motor control	LGIS	• MCQ • SAQ/SEQ • Structured Viva

Hypothalamus	Correlate physiological anatomy with	Explain functions of hypothalamic nuclei	LGIS	• MCQ • SAQ/SEQ
	disorders of hypothalamus			• Structured Viva
Practicals/SGDs: 1. Examine the 1ST – 6TH Cranial nerves on an SP 2. Examine the 7th – 12th Cranial nerves on an SP				
BIOCHEMISTRY				
Topic/ Theme	**Learning outcomes**	**Learning Objectives/Contents**	**Instructional strategies**	**Assessment tool**
Nutrition	• Appraise the nutritional requirements of each food constituent for better understanding of relevant disorders • Outline nutritional requirement in different commonly occurring disorders Review hazards of under and over nutrition	• Balanced Diet, DRIs (EAR, RDA, AI, UL), AMDR • Proteins (Protein turnover, Amino acid Pool, Nitrogen Balance, Protein Quality, Protein Requirement • Biomedical importance, • requirements ofdietary Carbohydrates, Proteins and Lipids • Glycemic Index • Protein-Energy Malnutrition (Kwashiorkor, Marasmus)	• Lectures • SGD • PBL • CBL	MCQ/ SAQ/SEQ

Vitamins	Discuss the importance of Vitamins in Health	• Introduction, classification • Fat soluble vitamins: chemistry, biochemical functions, deficiency manifestations, • daily allowances, sources and hypervitaminosis • Water soluble vitamins: chemistry, biochemical	• Lectures • SGD • PBL • CB	MCQ/ SAQ/SEQ
		functions, deficiency manifestations, • daily allowances, sources and hypervitaminosis		
Minerals and Tr elements	• Classifying minerals • Discuss • Biochemical roles of minerals	• Classification and biochemical role of Macro minerals (Na, K, Ca, Cl, PO4) • Classification and biochemical role of Micro minerals (Fe, Zn, • Mg, Se, I, F, Cu, Cr, Cd, Mn) • Mechanism of HG toxicit	• Lectures • SGD • PBL CBL	
Integration of Metabolism	• Discuss the biochemical basis of obesity & Diabetes Mellitus • Relate the significance of ketone bodies • Outline metabolic rold of insulin & Glucagon	• Obesity • Diabetes Mellitus • Ketone bodies and their biomedical significance • Metabolic role of Insulin & Glucagon	• Lectures • SGD • PBL • CBL	MCQ/ SAQ/SEQ
Practicals: Estimation of vitamin c by Titration method				

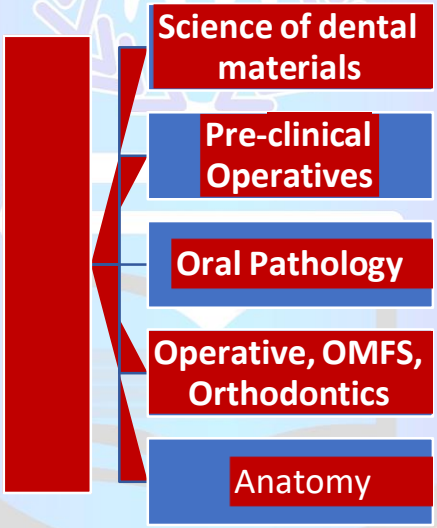
BDS YEAR-I

SPIRAL-II

Essentials of Dentistry-I

BLOCK-I

Dental Foundation-I



Module 1: Orofacial Biology

Duration: 2 weeks

Topic	Learning outcome	Learning objective	Integrated Learning objectives with other subjects
Introduction to orofacial structures	Discuss the anatomical features of orofacial structures	Identify the names and locations of skeletal, dental, and soft tissue structures present in orofacial region.	
General embryology	Discuss the events of development during early weeks of embryogenesis	a. Define gastrulation (formation of three germ layers) b. Discuss the development, significance, and fate of primitive streak c. Explain the development of notochordal process, notochord canal and prechordal plate. d. List the various derivations of the three germ layers. e. Explain neural crest cells, their formation, migration, and derivatives **Skills:** Identify the embryological structures and processes in pictures.	

Module 2: Tooth Form & Structure

Duration: 3 weeks

Topic	Learning outcome	Learning objective	Integrated Learning objectives with other subjects
Introduction to tooth morphology	Discuss the basic nomenclature and tooth numbering systems to understand tooth morphology	Classify dentition	**Pre-clinical Operatives** Discuss the nomenclature and various terminologies used for tooth preparation **Orthodontics** Age estimation on the basis of dentition
		Differentiate different tooth numbering system	
		Discuss the basic terminology used to discuss morphological features of teeth.	
		List the sequence of normal tooth eruption and shedding. **Skills:** Identify oral and other associated dental structures. Identify the teeth and their number on models / pictures by using various numbering systems.	
Physiological considerations of tooth morphology	Correlate normal tooth forms and alignment to its function and form the basis of physiologic considerations of teeth and their supporting structures	a) Discuss the functions of the morphological features present on teeth. b) Correlate the functions of teeth and their morphological features with clinical scenarios.	
		Explain the general rules / trends observed in certain morphological features such as cervical movement of contact point when moving from anterior to posterior teeth.	

Module 3: Growth & Development

Duration: 5 weeks

Topic	Learning outcome	Learning objective	Integrated Learning objectives with other subjects		
Development of orofacial structures	Correlate orofacial development to its clinical significance		**Oral Pathology**	**OMFS**	**Orthodontics**
		Discuss formation of pharyngeal apparatus, its derivatives, and anomalies.			
		Explain the development of face in terms of processes involved and their role in formation of lips, nose, forehead, cheeks, and jaws.			
		Discuss the developmental anomalies associated with incomplete fusion of facial processes. **Skills:** Identify the pharyngeal apparatus, its derivatives, and associated anomalies in pictures. Identify in pictures/images developmental anomalies associated with incomplete fusion of facial processes.	**Orthodontics** Describe briefly the normal growth and development of the craniofacial complex. **Oral Pathology** List the causes of dentofacial deformities.		
		Discuss etiological factors responsible for congenital defects affecting facial development.	**Orthodontics** Explain briefly the different theories of growth. **OMFS** Classify cleft lip and palate.		

		Classify developmental anomalies and defects in the development of oral structures. **Skills:** Identify various palatal clefts in pictures.	**OMFS** List the OMF problems faced by a cleft patient.
Tooth Development	Correlate the knowledge of tooth development to its clinical significance	Outline the formation of odontogenic epithelium, primary epithelial band, and dental placodes.	**Oral Pathology** Discuss the developmental abnormalities associated with teeth.
		Explain the formation of dental and vestibular lamina	
		Discuss the process of tooth initiation	
		Discuss the theories tooth type determination	
		Explain the histological features of the stages of tooth development	
		Explain formation of single and multiple roots	
		Discuss the process of hard tissue formation	
		List the sequence of normal tooth eruption and shedding. **Skills:** Draw the histological features of tooth development. Identify the developmental anomalies of tooth in pictures and study models	

Module 4: Dental Tissues

Duration: 3 weeks

Topic	Learning Outcome	Learning Objectives	Integrated Learning objectives with other subjects
Enamel	Correlate the developmental and histo-morphological knowledge of enamel with different clinical scenarios	a. Outline the physical properties and chemical composition of enamel	**Operative Dentistry** Orientation of enamel rods during cavity prep Cavo-surface angle
		b. Discuss the process of amelogenesis	
		c. Illustrate the microscopic structure of enamel	**Oral Pathology** Amelogenesis imperfecta
		d. Illustrate the histological features of enamel	
		e. Correlate the developmental defects of enamel with the process of amelogenesis	
		f. Correlate the physical and chemical properties and microstructure of enamel with various clinical considerations	
		Skills: Draw the microstructure and histological features of enamel. Daw the histological features of amelogenesis. Identify the congenital anomalies associated with enamel	
Dentin-pulp complex	Correlate the developmental and histo-morphological knowledge of Dentin-pulp complex to	a. Outline the physical properties and chemical composition of dentin-pulp complex	
		b. Discuss the process of dentinogenesis	
		c. Illustrate the microscopic structure of dentin-pulp complex	

	different clinical scenarios	d. Illustrate the histological features of dentin-pulp complex	
		e. Correlate the developmental defects of dentinogenesis with the process of amelogenesis	
		f. Discuss the theories of dentin sensitivity	
		Discuss the defensive and reparative mechanisms of dentin-pulp complex.	**Pre-clinical Operative** Discuss the defensive and reparative mechanisms of dentin-pulp complex. (VILP) **Operative Dentistry** Define the basic concept of adhesion to enamel and dentin.
		g. Discuss the physical and chemical properties and microstructure of dentin-pulp complex.	**Science of dental materials** Describe the concept of bonding and adhesion in dentistry. Compare the development of smear layer and hybrid layer with reference to the acid etch technique.**perative Dentistry** Enumerate the basic concepts of adhesion to enamel and dentin
		h. List the age changes of dentin-pulp complex and correlate them with clinical scenarios.	
		i. Discuss the process of repair and regeneration in dentin-pulp complex.	**Pre-clinical Operatives** Discuss the basic concept of adhesion to enamel, dentin, and cementum

		Skills: Draw the microstructure and histological features of dentin-pulp complex. Draw the histological features of dentinogenesis. Identify the congenital anomalies associated with dentin. Identify the age changes, reparative and defensive features on pictures.	**Operative Dentistry** Discuss the abnormalities associated with tooth structure i.e., enamel, dentin, and cementum defects.

BLOCK II

DENTAL & PERIODONTAL TISSUES IN HEALTH & DISEASE I

Module 1: Periodontal Tissues
Duration: 4 weeks

Topic/ Theme	Learning outcome At the end of this module, student will be able to:	Learning objective At the end of this module, student will be able to:	Integrated Learning objectives with other subjects Oral Pathology / Prostho / Perio / Ortho / Operative
Bone	Correlate the developmental and histo-morphological knowledge of bone to different clinical scenarios.	Outline the physical and chemical properties of bone Explain the general and gross anatomy of bone Explain the gross anatomy of alveolar, mandibular, and maxillary bone Classify the various types of bone with respect to gross appearance, histology, development etc. Illustrate the histological features of bone f) Discuss the process of bone development and growth Discuss the process of bone remodeling Correlate important anomalies/disorders related to bone with special orofacial development. Discuss the process of repair and regeneration in bone. **Skills:** Draw the microstructure and histological features of bone. Draw the histological features of bone development. Identify the congenital anomalies associated with bone.	**Oral Pathology** List the benign lesions of bone **Prosthodontics** Explain the alveolar bone resorption rate and its pattern in edentulous maxilla and mandible.

		Identify the age changes in bone in pictures.	
Periodontium	Correlate the developmental and histo-morphological knowledge of periodontium to different clinical scenarios	**Skills:** a. Define the structural and histological components of periodontium. b. Discuss physical and chemical properties of cementum. c. Classify cementum in terms of presence or absence of cells, origin of collagen fibers. d. Discuss the cementum types (primary, secondary, mixed, and acellular) in terms of cells, origin of fibers, location, function, formation/development mineralization. e. Classify cementoenamel junction and discuss clinical significance. f. Discuss histological appearance and significance of cementodentinal junction. g. Discuss age related changes and reparative process occurring in cementum. h. Explain the formation of periodontal ligament development. i. Discuss the location, average width, content function, remodeling and age changes occurring in PDL. j. Discuss the principal fiber bundles of periodontal ligament and the bundles of gingival ligament and discuss their clinical significance. k. Explain the blood supply of periodontal ligament in terms of names of blood vessels, branching pattern and distribution of the vessels.	**Periodontology/3rd Year** Describe the clinical significance of periodontium. Enumerate the features of age changes in periodontium. Outline blood supply, nerve supply and lymphatic drainage of periodontium of all teeth. **Orthodontics** Explain normal bone physiology and metabolism with respect to orthodontic tooth movement. **Operative Dentistry** COMPOSITE: Define polymerization shrinkage and C factor.

		l. Discuss nerve supply of periodontal ligament in terms of names of nerves, types of nerve fibers, location, type of neural termination and branching pattern. m. Correlate the neurovascular supply of periodontium with clinical scenarios such as wound healing etc. n. Discuss histological changes seen in periodontium in response to various functional demands and correlate it with clinical scenarios o. Discuss the process of repair and regeneration in periodontium p. Identify cementum in images/slides of ground section of tooth. q. Identify the various types of cementum in histological pictures/slides. r. Draw and label the histology of different types of cementum. s. Identify in images/histological slides, draw, and label, and describe the location, direction/orientation, origin, insertion and function of principal fibers of periodontal ligament and gingival ligament. t. Identify the gingiva, free gingiva, attached gingiva, col, and interdental gingiva in images / study models.	

Module 2: Tooth Morphology & Physiology
Duration: 6 weeks

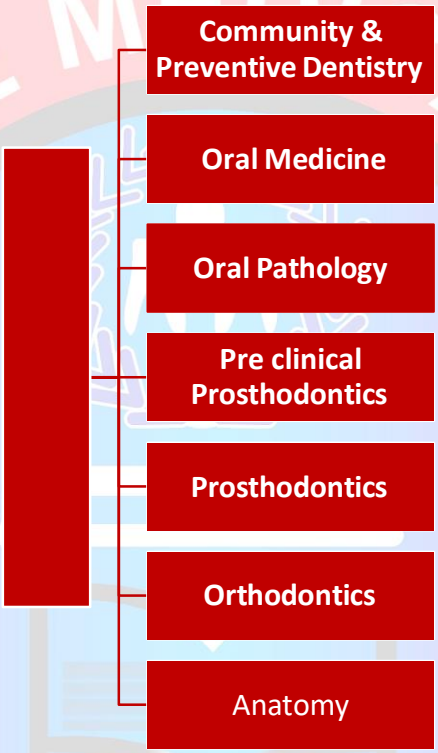
Topic/Theme	Learning outcome At the end of this module, student will be able to:	Learning objective At the end of this module, student will be able to:	Integrated Learning objective **Orthodontics**
Eruption & Shedding	Discuss the various types of physiological tooth movements and associate them with clinical scenarios.	a) List the various types of physiological tooth movements.	Explain briefly the development of dentition. Identify periods of primary, mixed, and permanent dentition and eruption sequence.
		b) Discuss the process of pre-eruptive, eruptive, and post-eruptive tooth movements.	
		c) Explain the various theories of eruptive tooth movement. d) Correlate theories of eruptive tooth movement with clinical scenarios such as eruption of rootless teeth.	
		e) Discuss the histological changes occurring during tooth eruption.	
		f) Discuss the histological features of tooth shedding along with the factors responsible for this process.	**Orthodontics** Mechanism of orthodontic tooth movements
		g) Correlate the chronological order of tooth eruption and shedding with dental and chronological age and with various clinical scenarios.	

		h) Discuss various types of abnormal tooth movements. i) Correlate various types of abnormal tooth movements clinically. j) Discuss the histological aspects of orthodontic tooth movement. **Skills:** Identify the dental age on images / study models. Draw labelled diagrams the histological features of eruption and shedding.	
Morphology of individual permanent anterior teeth	Describe the basic anatomy of permanent dentition and compare the morphological features of teeth within each class, i.e., incisors and canines.	a) Tabulate for all permanent teeth the initiation of calcification, completion of enamel and root in terms of months/years b) Illustrate the morphological features of the crown of each tooth from all aspects with respect to shape, boundaries, dimensions, elevations, and depressions. c) Discuss number, shape, and inclination of root/roots in each tooth. d) Discuss number, location, and significance of pulp canals in each tooth.	
Morphology of individual permanent posterior teeth	Describe the basic anatomy of permanent dentition and compare the morphological features of teeth within each class, i.e., premolars and molars.	a) Tabulate for all permanent teeth the initiation of calcification, completion of enamel and root in terms of months/years. b) Illustrate the morphological features of the crown of each tooth from all aspects with respect to shape, boundaries, dimensions, elevations, and depressions.	

		c) Discuss number, shape, inclination of root/roots in each tooth. d) Discuss the number, location, and significance of pulp canals in each tooth. **Skills:** Identify every single tooth on study models / pictures / images based on morphological features. Draw labelled diagrams of morphological features of each tooth from all aspects and sections of crown and root.	
Morphology of individual deciduous teeth	Discuss the basic anatomy of deciduous dentition and differentiate it from the permanent dentition.	a) Tabulate general morphological differences between permanent and deciduous teeth. b) Illustrate the morphological features of the crown of each tooth from all aspects with respect to shape, boundaries, dimensions, elevations, and depressions. c) Discuss number, shape, inclination of root/roots in each tooth. d) Discuss the number, location, and significance of pulp canals in each tooth. **Skills:** Identify every single tooth in pictures / images based on morphological features. Draw labelled diagrams of the morphological features of each tooth from all aspects and sections of crown and root.	

BLOCK III

CRANIOFACIAL STRUCTURES: A COMPREHENSIVE



Module 1: Oral Mucosa
Duration: 4 weeks

Topic	Learning outcome	Learning objective At the end of this block, student will be able to:	Integrated Learning objective with other subjects
Oral Mucosa	Correlate the basic knowledge of oral mucosa to different clinical scenarios.	a. Define oral b. Discuss various types or oral mucosa with respect to their distribution, attachment, surface features and physical properties.	
		c. Discuss the gross features, surface landmarks, boundaries, and clinical features of various types of oral mucosa d. Correlate the oral mucosa with clinical scenarios (such as suturing of various types of mucosae etc).	**Preclinical Prosthodontics** Identify anatomical landmarks and limiting structures of maxillary and mandibular arch.
		e. Discuss the functions of oral mucosa and correlate them clinical scenarios.	
		f. Explain the components of oral mucosa along with its variations in different parts of oral cavity	
		g. Discuss the types and layers of oral epithelium and discuss the differences between the two main types of oral epithelium in each layer.	
		h. Explain the processes of epithelial proliferation, maturation, and desquamation of oral epithelium at histological and cellular levels.	

		i. List the non-keratinocytes present in oral epithelium and discuss their nature, shape, location, and function in oral epithelium. j. Correlate the non-keratinized epithelium with clinical scenarios such as oral pigmentation etc.	**Oral Pathology** Identify various oral mucosal lesions. **Oral Medicine**
			Define the basic clinical terminologies related to oral mucosa (i.e. vesicles, bullae, and hyperkeratosis).
		k. Discuss the layers and components of basal lamina. l. Correlate basal lamina with various clinical scenarios such as vesiculobullous conditions.	
		m. Explain lamina propria in terms of its components, thickness, histology, and variations in different types of oral mucosa.	
		n. Discuss the neurovascular supply of oral mucosa in detail o. Correlate neurovascular suuply of oral mucosa with clinical scenarios such administration of local anesthesia.	
		p. Explain the structural variations present in different types of oral mucosa such as lingual papillae, palatine rugae etc. q. Correlate the structural variations in oral mucosa with clinical pictures.	
		r. Discuss the three clinically visible junctions present in oral mucosa, i.e., Mucogingival, mucocutaneous and dentogingival junctions. s) Discuss clinical and histological features of mucogingival, mucocutaneous, and dentogingival junctions. s. Correlate clinically visible junctions with clinical scenarios.	**Preclinical Prosthodontics** Analyze anatomical landmarks and limiting structures of maxillary and mandibular arch

		t. Define attached gingiva, free gingiva, gingival sulcus, junctional epithelium, sulcular epithelium, dentogingival junction, Col.	
		u. Discuss the development of oral mucosa. w) Discuss the age changes that take place in oral mucosa. v. Correlate the age changes of oral mucosa with clinical scenarios. **Skills:** Identify in histological pictures/images keratinized and non-keratinized epithelium. Identify tongue papillae in histological slides/images. Draw the histological features, location, and function of taste bud. Identify Fordyce's granules in pictures/images. Identify on study models / images junctions in oral cavity (mucogingival, dentogingival, mucocutaneous).	**Community & Preventive Dentistry** Discuss the concept of health and disease causation.
		w. Discuss the process of repair and regeneration in oral mucosa.	

Module 2: Paraoral Structures
Duration: 6 weeks

Topic/ Theme	Learning outcome	Learning objective	Integrated Learning objective with other subjects	
			Oral Medicine	Prosthodontics
Temporomandibular joint (TMJ)	Correlate the developmental, anatomical, and histological features of temporo-mandibular joint with clinical scenarios	a. Discuss the various types of jaw joints along with the description of their range of motion.		
		b. Discuss the gross anatomy of various parts of TMJ, i.e., Capsule, Synovial membrane, condylar head, articular eminence, Temporal fossa, Articulating disc, associated ligaments and muscles, neurovascular supply.		
		c. Explain the histological features of all components of TMJ.		
		d. Discuss the movement and mechanics of TMJ with reference to the shape of its bony components, muscles of mastication involved, presence of two joint cavities, anatomy and histology of articulating disc and capsule, associated ligaments etc.	**Prosthodontics** Explain the clinical significance of muscles of mastication in dentures.	
		e. Discuss the process of disc dislocation and locked jaw and explain the maneuver to relocate/reduce the jaw.	**Oral Medicine** Classify TMJ disorders	
		f. Discuss the development of TMJ and associate the development with various clinical scenarios. g. Describe the manoeuvre for TMJ reduction. **Skills:**		

		h. Identify the gross and histological parts of TMJ on study models, specimen, images etc. i. Draw and label the gross anatomy and histology of TMJ.	
Salivary glands	Correlate the development, anatomy, and physiology of Salivary glands with its clinical significance	a. Recall the anatomy of major salivary glands	
		b. Discuss functions of saliva	**Oral Medicine** Discuss composition and functions of saliva
		c. Explain production and modification of saliva	
		d. Illustrate histology of major and minor salivary glands	
		e. Explain the neurovascular supply of salivary glands	
		f. Explain development of salivary glands	
		g. Correlate basic knowledge of salivary glands with age changes and clinical scenarios **Skills:** Identify the salivary glands and their ducts on study models/pictures. Draw labelled diagrams of histology of major and minor salivary glands.	
Maxillary sinus	Discuss the growth / developmental and anatomical aspects of maxillary sinus and correlate it with various clinical scenarios	a. Discuss location and anatomy of maxillary sinus with special emphasis to its proximity to root apices of maxillary teeth b. Explain development and growth of maxillary sinus c. Apply anatomical and developmental aspects of	

		maxillary sinus in clinical scenarios. **Skills:** Identify the sinus, its openings, and its proximity with teeth on study models and pictures.	

Research Methodology

Blocks	Topic/ Theme	Learning Outcomes	Learning Objectives/Contents	Instructional strategies	Assessment Tool
I	**Introduction to research**	Discuss historical background of research in medicine	Meaning, historical background, introduction to medical research, important terminologies	LGIS/ SGD	MCQ/ SEQ
	Importance of research	Discuss significance of research in medicine	Evidence based practice, application in health sciences	LGIS/ SGD	MCQ/ SEQ
	Introduction to research process	Explain the process and requirements of a good research for a doctor	Overview of process of research, characteristics of a good research, qualities of a good researcher	LGIS/ SGD	MCQ/ SEQ
	Types of research	Classify different types of research and its applications	Basic and applied; quantitative and qualitative, observational and interventional studies	LGIS/ SGD	MCQ/ SEQ
II	**Research problem and a good research question**	Able to identify research problem. Formulate a good research question	Identification of research problem. Criteria of selection of research topic	LGIS/ SGD	MCQ/ SEQ
	Title rationale & objectives of the study	Able to justify the research study title with reference to objectives	Characteristic of a good title & Justification of topic Formulation of SMART research objectives.	LGIS/ Group assignment	MCQ/ SEQ

	Introduction of variable and data	Identify different types of data and variables	Data types Define and identify different types of Qualitative and Quantitative variables. Independent and dependent variables	LGIS/ Group assignment	MCQ/ SEQ
III	**Literature Review**	Able to search scientific literature related to the chosen topic from medical data basis and digital library/ from internet/ library	Purpose and types of literature medical literature (original study. Case study systematic review, Meta-analysis); Sources of information Libraries - provide access to many types of resources • Internet / Databases • Books Journals /Conference proceedings	LGIS/ Group assignment	MCQ/ SEQ
	Literature search	Perform scientific literature search on selected topic by using different technique/ methods.	Search techniques, use of keywords, Boolean searching • Understand the steps in conducting a systematic review • Develop an answerable question using the "Participants Interventions Comparisons Outcomes" (PICO) framework • Interpret the results of meta-analyses	LGIS/ Group assignment	MCQ/ SEQ

	Operational definition Hypothesis	Formulate operational definition and research hypothesis	Formulation of operational definition of impotent variables. Types of research hypothesis	LGIS/ SGD	MCQ/ SEQ

ISLAMIC STUDIES/ IDEOLOGY AND CONSTITUTION OF PAKISTAN

This course is designed to provide students with a comprehensive overview of the fundamental aspects of Islam, its beliefs, practices, history and influence on society. It will further familiarize the students with a solid foundation in understanding Islam from an academic and cultural perspective. Through this course, students will have an enhanced understanding of Islam's multifaceted dimensions which will enable them to navigate complex discussions about Islam's historical and contemporary role, fostering empathy, respect, and informed dialogue

S No.	Learning Outcomes By the end of this course, students will be able to:	Course Contents	Instructional strategies	Assessment Tool
1.	▪ Demonstrate enhanced knowledge of Islamic foundational beliefs, practices, historical development, spiritual values and ethical principles. ▪ Describe basic sources of Islamic law and their application in daily life. ▪ Identify and discuss contemporary issues being faced by the Muslim world including social challenges, gender roles and interfaith interactions.	**Introduction to Islam:** • Definition of Islam and its core beliefs. • The Holy Quran (introduction, revelation and compilation). • Hadith and Sunnah (compilation, classification, and significance). • Key theological concepts and themes (Tawhid, Prophethood, Akhirah etc.). Sirah of the Holy Prophet (Peace Be Upon Him) as Uswa-i-Hasana: • Life and legacy of the Holy Prophet PBUH. • Diverse roles of the Holy Prophet PBUH (as an individual, educator, peace maker, leader etc)	Lecture/ Presentation/ Large group Interactive session (LGIS)/SGD	**EA**: MCQs and SEQs **IA:** quizzes, presentations, assignments, group projects and reflective writing

2.		**Islamic History and Civilization:** • World before Islam. • The Rashidun Caliphate and expansion of Islamic rule. • Contribution of Muslim scientists and philosophers in shaping world civilization		
3.		**Islamic Jurisprudence (Fiqh):** • Fundamental sources of Islamic jurisprudence. • Pillars of Islam and their significance. • Major schools of Islamic jurisprudence. • Significance and principles of Ijtihad.		
4.		**Family and Society in Islam**: • Status and rights of women in Islamic teachings. • Marriage, family, and gender roles in Muslim society, • Family structure and values in Muslim society		
5.		**Islam and the Modern World:** • Relevance of Islam in the modern world (globalization, challenges and prospects).		

		• Islamophobia, interfaith dialogue, and multiculturalism. • Islamic viewpoint towards socio-cultural and technological changes.		

IDEOLOGY AND CONSTITUTION OF PAKISTAN

This course is designed to provide students with a fundamental exploration of the ideology and the constitution of Pakistan. The course focuses on the underlying principles, beliefs, and aspirations that have been instrumental in shaping the creation and development of Pakistan as a sovereign state. Moreover, the course will enable students to understand the core provisions of the Constitution of the Islamic Republic of Pakistan concerning the fundamental rights and responsibilities of Pakistani citizens to enable them function in a socially responsible manner.

By the end of this course, students will be able to:

1. Demonstrate enhanced knowledge of the basis of the ideology of Pakistan with special reference to the contributions of the founding fathers of Pakistan.
2. Demonstrate fundamental knowledge about the Constitution of Pakistan 1973 and its evolution with special reference to state structure.
3. Explain about the guiding principles on rights and responsibilities of Pakistani citizens as enshrined in the Constitution of Pakistan 1973.

1. Introduction to the Ideology of Pakistan:

Course Outline

- Definition and significance of ideology.
- Historical context of the creation of Pakistan (with emphasis on socio-political, religious, and cultural dynamics of British India between 1857 till 1947).
- Contributions of founding fathers of Pakistan in the freedom movement including but not

limited to Allama Muhammad Iqbal, Muhammad Ali Jinnah., etc.

- Contributions of women and students in the freedom movement for separate homeland for Muslims of British India

2. Two-Nation Theory:

- Evolution of the Two-Nation Theory (Urdu-Hindi controversy, Partition of Bengal, Simla Deputation 1906, Allama Iqbal's Presidential Address 1930, Congress Ministries 1937 Lahore Resolution 1940).
- Role of communalism and religious differences

3. Introduction to the Constitution of Pakistan:

- Definition and importance of a constitution.
- Ideological factors that shaped the Constitution(s) of Pakistan (Objectives Resolution 1949).
- Overview of constitutional developments in Pakistan

4. Constitution and State Structure:

- Structure of Government (executive, legislature, and judiciary).
- Distribution of powers between federal and provincial governments.
- 18th Amendment and its impact on federalism

5. Fundamental Rights, Principles of Policy and Responsibilities:

- Overview of fundamental rights guaranteed to citizens by the Constitution of Pakistan 1973 (Articles 8-28).
- Overview of Principles of Policy (Articles 29-40).
- Responsibilities of the Pakistani citizens (Article 5).

6. Constitutional Amendments:

- Procedures for amending the Constitution.
- Notable constitutional amendments and their implications

HEC RECOMMENDED COURSES

Teaching of Holy Quran

1. It is evident from every aspect that Islam is not merely a religion, rather it is a conduct of life. To live a life that is pious, virtuous and true to the values of humanity, one will always find refuge under the umbrella of Islam. Moreover, the prime source of guidance that Islam offers to all those who seek Truth is Quran. As Quran is the prime source of guidance for all the humanity, especially Muslims, therefore, it is the duty of parents, colleges and universities to ensure that the students get proper Quran education. The Qur'an is a very important component of human life because the Qur'an is revealed by Allah to fulfill one of the basic principles of human life; need to achieve salvation and happiness in the world and in the hereafter. To achieve this basic human need, man needs guidance (al-huda), explanation (al bayan), warning and distinguishing between good and bad.
2. The significance of teachings of Quran can't be denied by any means. The right teachings of Quran and its understanding at this level is very crucial and important.

EXPOSITORY WRITING

DESCRIPTION

Expository Writing is a sequential undergraduate course aimed at refining writing skills in various contexts. Building upon the foundation of the pre-requisite course, Functional English, this course will enhance students' abilities of producing clear, concise and coherent written texts in English. The course will also enable students to dissect intricate ideas, to amalgamate information and to express their views and opinions through well-organized essays.

Learning Outcomes	Course Contents	Instructional strategies	Assessment Tool
By the end of this course, students will be able to:			

• Understand the essentials of the writing process integrating pre-Writing, drafting, editing and proof reading to produce well-structured essay s. • Demonstrate mastery of diverse expository types to address different purposes and audiences. • Uphold ethical practices to maintain originality in expository writing	**Introduction to Expository Writing**: • Understanding expository writing (definition, types, purpose and applications) • Characteristics of effective expository writing (clarity, coherence and organization) • Introduction to paragraph writing. **The Writing Process:** • Pre-writing techniques (brainstorming, free-writing, mind-mapping, listing, questioning and outlining etc.) • Drafting (three stage process of drafting techniques) • Revising and editing (ensuring correct grammar, clarity, coherence, conciseness etc.) • Proof reading (fine-tuning of the draft) • Peer review and feedback (providing and receiving critique)	Lecture/ Presentation/ Large group Interactive session (LGIS)/SGD	**EA**: SEQs **IA:** presentations, assignments, group projects, case studies, reflective writing, report writing and research oriented writing
	Essay Organization and Structure: • Introduction and hook (engaging readers and introducing the topic) • Thesis statement (crafting a clear and focused central idea) • Body Paragraphs (topic sentences, supporting evidence and transitional devices) • Conclusion (types of concluding paragraphs and leaving an impact) • Ensuring cohesion and coherence (creating seamless connections between paragraphs)		

	Different Types of Expository Writing: • Description • Illustration • Classification • Cause and effect (exploring causal relationships and outcomes) • Process analysis (explaining step-by-step procedures) • Comparative analysis (analyzing similarities and differences)		
	Writing for Specific Purposes and Audiences: • Different types of purposes (to inform, to analyze, to persuade, to entertain etc.) • Writing for academic audiences (formality, objectivity, and academic conventions) • Writing for public audiences (engaging, informative and persuasive language) • Different tones and styles for specific purposes and audiences		
	Ethical Considerations:		

	• Ensuring original writing (finding credible sources, evaluating information etc.) • Proper citation and referencing (APA, MLA, or other citation styles) • Integrating quotes and evidences (quoting, paraphrasing, and summarizing) • Avoiding plagiarism (ethical considerations and best practices) Practical Applications and Capstone Project • As part of the overall learning requirements, students will be required to build a writing portfolio having a variety of expository texts and present the same at the end of the course showcasing proficiency in expository writing		

1. "The St. Martin's Guide to Writing" by Rise B. Axelrod and Charles R. Cooper.

2. "They Say /1 Say: The Moves That Matter in Academic Writing" by Gerald Graff and Cathy Birkenstein.

3. "Writing Analytically" by David Rosenwasser and Jill Stephen

4. "Style: Lessons in Clarity and Grace" by Joseph M. Williams and Joseph Bizup.

5. "The Elements of Style" by William Strunk Jr. and E.B. White.

6. "Good Reasons with Contemporary Arguments" by Lester Faigley and Jack Setzer.

7. "Writing to Learn: How to Write - and Think - Clearly About Any Subject at All" by William Zinsser.

8. "The Norton Field Guide to Writing" by Richard Bullock, Maureen Daly Goggin, and Francine Weinberg.

9. "The Art of Styling Sentences" by Ann Longknife and K.D. Sullivan.

10. "Writing Today" by Richard Johnson-Sheehan and Charles Paine,

Clinical Photography and Videography

Learning Outcomes	Learning Objective/Content	Instructional Strategies	Assessment Tool	Teaching Faculty
1st Year (25 Hours)				
At the end of module, student should be able to:				
Recognize the significance and ethical protocols of Clinical Photography and Videography	**Introduction to Clinical Photography and Videography** • Significance of clinical photography and videography in healthcare system • Ethical Protocols in healthcare system	• Lecture/ Presentation	**EA**: MCQs, SAQs and SEQs **IA:** quizzes, presentations, assignments, group projects, case studies, reflective writing and student portfolios	• Guest Speaker • Faculty of Behavioral Sciences
Differentiate between various types, equipment and operating techniques of camera	**Understand Fundamentals of Photography** • Types of Camera including specifications • Understanding exposure (aperture, shutter speed, ISO) • Composition and framing techniques • Lighting considerations	• Lectures/Presentations • Interactive Video Vignettes • Large group Interactive session (LGIS)		

Capture high-quality images and videos of medical procedures, patient interactions, and other relevant clinical scenarios at workplace.	**Understand Fundamentals of Videography** • Camera types and specifications for video recording • Understanding frame rates, resolution, and video formats • Composition and framing techniques for video • Lighting considerations for video • Audio recording and considerations	• Lectures/Presentations • Interactive Video Vignettes • Large group Interactive session (LGIS)		
Select camera apparatus and equipment wisely	**Discuss Apparatus and Operation** • Choosing appropriate cameras and lenses • Additional apparatus • Setting up a clinical photography workspace followed by videography	• Lectures/Presentations • Interactive Video Vignettes • Large group Interactive session (LGIS)		
Demonstrate the awareness of cultural, social, and individual factors influencing patient participation	**Comprehend Active Patient Participation and Sanction** • Building rapport with patients • Obtaining informed consent for photography and videography • Explaining the purpose and potential use of visual documentation	• Lectures/Presentations • Documentaries, Short Films and Videos (e.g. on common ethical dilemmas) • Role-playing with peers • Case-Based Learning (CBL)		

Shoot standardized clinical images keeping in mind the advantages and limitations of different imaging modalities.	**Describe Medical Imaging Approaches** • Standardized views and angles for different body areas • Close-up and macro photography • Photographing wounds, scars, and skin conditions • Incorporating photography in patient examinations	• Lecture/ Presentation • Interactive Video Vignettes		
Use video recording techniques at workplace for diagnostic, educational, and research purposes.	**Understand Videography Modalities in Clinical Settings** • Capturing medical procedures and surgeries • Planning and recording patient interviews • Recording and presenting clinical presentations	• Lecture/ Presentation • Interactive Video Vignettes		
Organize & Catalog visual media in patients' records meticulously.	**Handling and Cataloging of Images and Videos** • File formats and resolution for images and videos • Naming, organizing, and archiving visual documentation. • Integrating photographs and videos into patient records	• Lecture/ Presentation • Interactive Video Vignettes		

Modify images & videos in accordance with ethical & professional guidelines	**Image and Video Optimization and Modification** • Basic editing techniques for photographs and videos • Removing identifying features and patient information • Ethical considerations in image and video editing	• Lecture/ Presentation • Interactive Video Vignettes		
Publish research papers on impact of adding visuals in patients' records	**Understand Research and Academic Visual Record Keeping** • Using photography and videography for research and publications • Integrating visuals into case reports and presentations • Guidelines for image and video selection and presentation	• Lecture/ Presentation • Interactive Video Vignettes		
Analyze the legal & ethical implications of photography & videos in clinical practice	**Discourse Legal and Ethical Perspectives** • Laws and regulations related to visual documentation • Confidentiality and privacy protection • Consent forms and documentation	• Lecture/ Presentation • Interactive Video Vignettes		

Apply theory to practice in simulated & clinical settings.	**Hands-on Workshops and Clinical Scenarios** • Hands-on practice with clinical photography and videography equipment • Case-based discussions on appropriate visual documentation techniques • Feedback and critique on photography and videography skills	• Lecture/ Presentation • Large Group Interactions • Worksheets • Roll Plays • Field Project • Interactive Video Vignettes		

CMH LAHORE MEDICAL COLLEGE
INSTITUTE OF DENTISTRY