Avicenna Medical & Dental College

AVICENNA
DENTAL COLLEGE

STUDY GUIDE

2023-2024



Program: Bachelor of Dental Surgery
Year: 1st Professional Year
Subject: Physiology
Batch No: D23
Session: 2023-2024

Department of Dental Education

Content

1. Introduction to Study Guide

- Objectives of the Study Guide……1
- Department of Medical Education……2

2. Avicenna Medical & Dental College Overview

- Institutional Organogram……4
- Vision and Mission……...…...4
- Messages:
  - From the Chairman……5
  - From the Principal……6
  - From the Vice Principal……6
- 7-Star Doctor Competencies (PMDC)……7
- About Dental College……7

3. Department & Subject Overview

- Note from the Head of Department……8
- Departmental Organogram……8
- Faculty Members……9
- Goal of the Department ……...9
- Course Objectives……10
- Attendance Requirement & Internal Assessment Criteria……10

4. Learning Resources & Pedagogy

- Book Recommendations……11
- Teaching Methodologies……11
- Infrastructure Resources……13
- Digital Library & Learning Management System……..……..15

5. Assessment Guideline

- Internal Assessment……..18
- External Assessment……20
- Sample Questions……..……..21

6. Curriculum Details

- Curriculum Framework & Allocation of hours……23
- Curricular Map & Rationale……..…….24
- Learning Outcomes……26
- Assessment TOS/Blueprint
- Refer to Curriculum Booklet for Syllabus, Statute ,Timetable and Annual Calendar and Weekly Schedule

Introduction to Study Guide

Welcome to the Avicenna Dental College Study Guide!

This guide serves as your essential resource for navigating the complexities of your dental education at Avicenna Medical & Dental College. It integrates comprehensive details on institutional framework, curriculum, assessment methods, policies, and resources, all meticulously aligned with UHS, PMDC and HEC guidelines.

Each subject-specific study guide is crafted through a collaborative effort between the Department of Dental Education and the respective subject departments, ensuring a harmonized and in-depth learning experience tailored to your academic and professional growth.



OBJECTIVES OF THE STUDY GUIDE

1. **Institutional Understanding:**
    - Gain insight into the college's organizational structure, vision, mission, and graduation competencies as defined by PMDC, setting the foundation for your educational journey.
2. **Effective Utilization:**
    - Master the use of this guide to enhance your learning, understanding the collaborative role of the Department of Dental Education and your subject departments, in line with PMDC standards.
3. **Subject Insight:**
    - Obtain a comprehensive overview of your courses, including detailed subject outlines, objectives, and departmental structures, to streamline your academic planning.
4. **Curriculum Framework:**
    - Explore the curriculum framework, academic calendar, and schedules for clinical and community rotations, adhering to the structured guidelines of UHS & PMDC.
5. **Assessment Preparation:**
    - Familiarize yourself with the various assessment tools and methods, including internal exam and external exam criteria, and review sample papers to effectively prepare for professional exams.
6. **Policies and Compliance:**
    - Understand the institutional code of conduct, attendance and assessment policies, and other regulations to ensure adherence to college standards and accrediting body requirements.
7. **Learning Resources:**
    - Utilize the learning methodologies, infrastructure resources, and Learning Management System to maximize your educational experience and academic success.

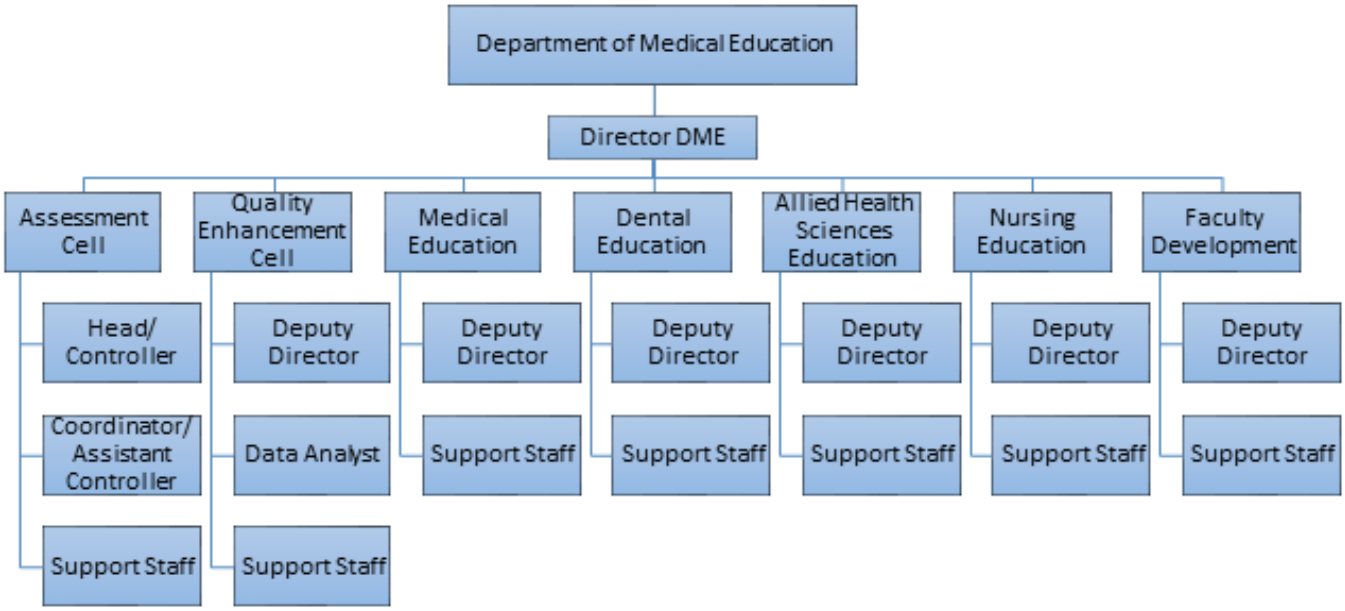
This guide, meticulously developed in collaboration with your subject departments, is designed to support your academic journey and help you achieve excellence in accordance with the highest standards set by PMDC and HEC.

DEPARTMENT OF MEDICAL EDUCATION

The Department of Medical Education (DME) serves as a cornerstone in delivering effective and high-quality education to both undergraduate and postgraduate medical and dental students. The DME is integral to the implementation and adoption of the latest curriculum provided by UHS and is responsible for organizing and managing related academic activities.

The DME will oversee the spirals of PERLs and C-FRC and monitor students' portfolio development and logbook completion. Additionally, the department is developing a mentoring platform and plans to initiate faculty development training which will focus on mentorship, reflective writing, and portfolio development skills. DME has a duty to collaborate with other disciplines to ensure that AVMDC students are not only competent in their respective fields but also well-trained in affective domains such as professionalism, ethics, research, and leadership.

A key responsibility of the DME is to plan and implement an effective training competency acquisition framework in collaboration with the academic council.



General Responsibilities of DME include:

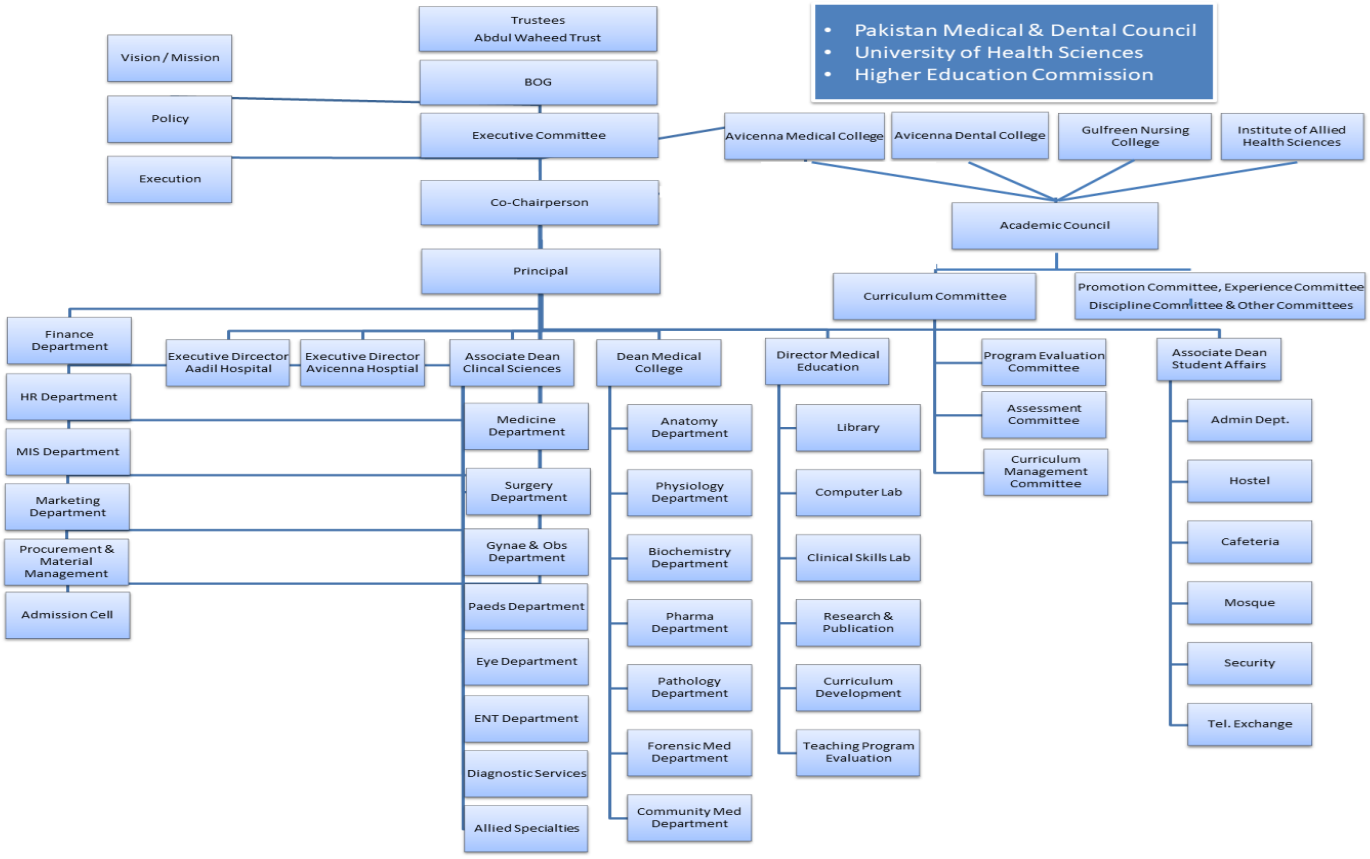
- Contribute and design, train the trainer activities which fulfill the need for undergraduate and postgraduate training.
- Shape and develop medical education research activities of the college.
- Facilitating & organizing workshops, seminars, symposia & conferences.
- Conducting CME activities to leverage culture of awareness, journal club.
- Networking by representing the college, when needed, in national /international meetings or conferences.
- Student counseling.
- Supervising students' academic progress.
- Academic Committees Development and Support.
- Staff Support and Development.
- Curriculum development and reform.
- Collaborate with curriculum committee and faculty members to develop quality instructional material such as modules, lecture, or study guides.

- Standard Operating Procedures for DME development.
- Skill lab management.
- Assessment analysis which includes blue printing, pre-exam review, item analysis and standard setting and provides feedback to concerned faculty and students on the learning outcome achievement.
- Develop and conduct periodical review of process of the program, learning and teaching activities, and assessment process.
- Identify opportunities for use of IT in teaching and learning, assessment and faculty development activities.
- Exam Cell management.
- Quality Assurance Cell management.
- Record keeping of departmental data.
- Leadership and management.
- Participation in overall planning and management of teaching in liaison with the departments.

Faculty	**Department**
Director DME	Dr. Gulfreen Waheed
Assistant Director / Assistant Professor Medical Education	Dr. Saman Fatima
Coordinator Medical Education	Dr. Javaid Shabkhaiz Rab
Deputy Director / Demonstrator Dental Education	Dr. Salar Arsalan
Deputy Director / Demonstrator Allied Health Sciences	Dr. Talha
Deputy Director / Demonstrator Nursing Education	Dr. Muneeba

Avicenna Medical & Dental College Overview

Institutional Organogram



Vision & Mission

Avicenna Medical & Dental College

Vision

The vision of **Avicenna Medical & Dental College** is to become a college that thrives to achieve improvement in healthcare of masses through creative delivery of educational programs, innovative research, commitment to public service and community engagement in a environment that supports diversity, inclusion, creative thinking, social accountability, life-long learning and respect for all.

Mission

The mission of **Avicenna Medical and Dental College** is to educate and produce competent, research oriented healthcare professionals with professional commitment and passion for life-long learning from a group of motivated students through quality education, research and service delivery for the improvement of health status of the general population.

Message from the Chairman

The Avicenna Medical & Dental College is a project of Abdul Waheed Trust which is a Non-profitable, Non-governmental, Non-political & Social organization, working for the welfare of Humanity and based on Community empowerment. Avicenna Medical College has its own 530 bedded Avicenna teaching Hospital (Not for Profit hospital) within the College Campus & 120 bedded Aadil Hospital, at 15 minutes distance. Separate comfortable hostels for boys & girls are provided on the campus.

Our students benefit from the state of the art College Library with facilities of Internet & online Journals that remain open 15 hours a day, for our students & faculty members. I am particularly pleased with the hard work by the Faculty and Students in the achievement of historic 100% results for all the classes. It is a rare achievement and speaks of dedication of the Faculty and Staff. Our motto is Goodness prevails and we aim at producing Doctors' who are knowledgeable, competent in clinical skills and ethical values.

Avicenna Medical College & Hospital was founded to provide quality health care services to the deserving patients belonging to the rural areas near Avicenna Hospital as well as to provide quality medical education of international standard to our students. The Hospital provides all medical services and Lab diagnostics to the local population at minimal cost. So far by the grace of Allah Almighty the number of patients being treated and operated upon at our Hospital is increasing every day as there is no other public or charity hospital in the circumference of 20km. We have already established two Satellite Clinics in the periphery which are providing outdoor care while admission cases are brought to the Hospital in Hospital transport.

Following the success of our reputable Medical College and Hospital, we were able to successfully establish Avicenna Dental College which is recognized by the Pakistan medical & Dental Council & University of Health Sciences. To date, we have enrolled five batches in our dental college and we aim to achieve the same level of success for our dental students as our medical students.

Chairman
Abdul Waheed Sheikh
Avicenna Medical & Dental College



Message from the Principal



Prof. Dr. Sohail Abbas Khan
Principal Dental College
MDS, Dip Op (Hons) BDS

It is a matter of immense honor and privilege as the first Principal of Avicenna Dental College to welcome you to one of the finest dental institutes in the private sector of Pakistan. Avicenna Dental College is a private dental college, which aims to provide the finest dental education to dental undergraduate students in accordance with the latest trends in Dental Education, and to develop them to practice dentistry in the 21st century.

While educating dental students to become licensed, empathetic and competent professionals, Avicenna Dental College endeavors to educate students in a supportive environment in which they provide dental care for a diverse populace. In the times to come, we wish to transform our graduates into unfeigned teachers, researchers and consultants by starting post-graduation programs as well.

Avicenna Dental College aims to achieve an enterprising curriculum integrating the basic sciences with clinical experience while utilizing modern technological modalities.

In addition to the production of outstanding oral health professionals, we at Avicenna Dental College recognize our responsibility as a private dental institution to the citizens of the country in making the provision of oral health care available to those who are deprived of ready access.

I feel proud to lead this dental establishment such an inspiring time and hope all of you at Avicenna Dental College will share this pride and play your respective roles in materializing the dream of making this institution the premier dental educator in Pakistan



Message from the Vice Principal

Prof. Dr. Usman Muneer
Vice Principal Dental College
BDS, FCPS

It is a matter of great privilege to be associated with Avicenna Dental College. Our institution boasts of renowned, well-qualified and devoted faculty members in each and every specialty of dentistry. We are looking forward to diligently equipping our undergraduates with comprehensive artistic and ethical oral health care.

Our goal is to inspire a lifelong passion for learning and innovation in our students, ensuring they are well-prepared to meet the evolving challenges of the dental profession. I look forward to collaborating with our students on this transformative journey, guiding them toward achieving excellence in oral health care

7-Star Doctor Competencies (PMDC)

According to national regulatory authority PMDC, a Pakistani medical/dental graduate who has attained the status of a 'seven-star doctor' is expected to demonstrate a variety of attributes within each competency. These qualities/ generic competencies are considered essential and must be exhibited by the individual professionally and personally.

1. Skillful / Care Provider.
2. Knowledgeable / Decision Maker.
3. Community Health Promoter / Community Leader.
4. Critical Thinker / Communicator
5. Professional / Lifelong learner.
6. Scholar / Researcher
7. Leader/ Role Model / Manager



About Avicenna Dental College

Avicenna Dental College is a purpose-built, fully equipped Dental institution with experienced and excellence-driven faculty to train high-quality dental professionals in Pakistan.

Avicenna Dental College runs under the umbrella of Abdul Waheed Trust. Abdul Waheed Trust is a non-profit social welfare organization and registered under the Societies Act with the Registrar of Societies. The Trust is legalized through a Trust Deed that bears necessary rectifications. The Trust Deed is further supported by its Memorandum and Article of Association that authorizes the establishment and operation of the Medical College, the Dental College, the Nursing College, the Allied Health Sciences College, and other activities in the healthcare sector.

In 2018, Avicenna Dental College was recognized by the Pakistan Medical & Dental Council. With the advent of advanced tools and technology in every field of health science, dentistry today has shot up to the greater end of the gamut with superior choice and promises in dental therapy in the very vicinity of the common man. ADC promises to be one such neighborhood.



Department & Subject Overview

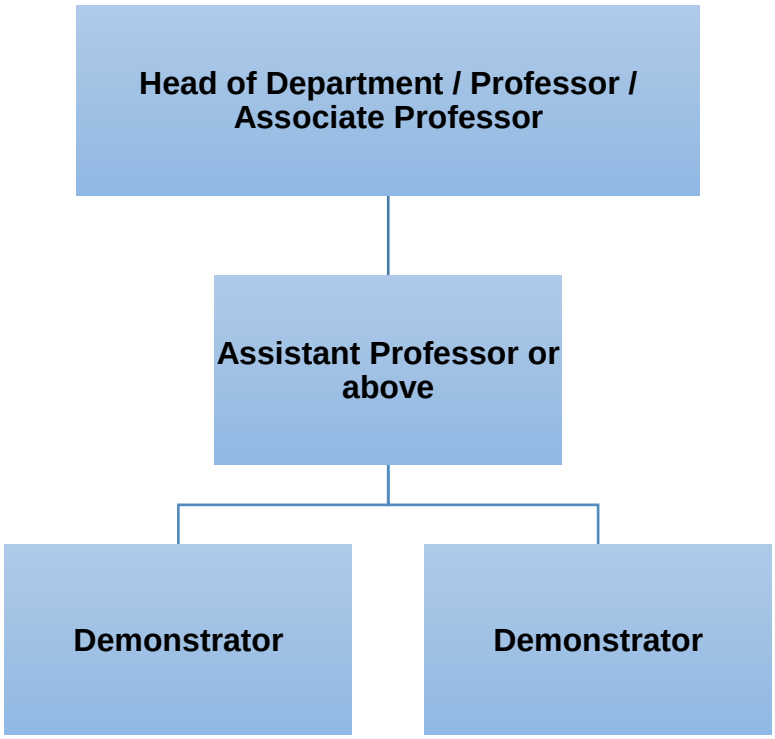
Note from the Head of Department

Human physiology seeks to understand the mechanisms that work to keep the human body alive and functioning, through scientific inquiry into the nature of mechanical, physical, and biochemical functions of humans, their organs, and the cells of which they are composed. The principal level of focus of physiology is at the level of organs and systems within systems. The endocrine and nervous systems play major roles in the reception and transmission of signals that integrate function in animals. Homeostasis is a major aspect with regard to such interactions within plants as well as animals. The biological basis of the study of physiology, integration refers to the overlap of many functions of the systems of the human body, as well as its accompanied form. It is achieved through communication that occurs in a variety of ways, both electrical and chemical

Prof. Dr. Sadia Zafar
Professor & Head of Department
Department of Physiology



Departmental Organogram (as per PMDC guidelines)



Faculty Members

Name	Designation	Qualification
Prof. Dr. Sadia Zafar	Head of Department	**MBBS, M Phil, PhD scholar**
Dr. Shaheena Naz	Associate Professor	**MBBS, M Phil**
Dr. Afsheen Akbar	Associate Professor	**MBBS, M Phil, PhD scholar**
Dr. Nida Waseem	Associate Professor	**MBBS, M Phil, PhD scholar**
Dr Fahad	Demonstrator	**MBBS**
Dr Areej	Demonstrator	**BDS**
Mr. Farooq	Lab Assistant	**I- com**
Mr. Haider	Lab Assistant	**I- com**

Goal of the Department



The Department of Physiology entails a huge physiology lab, which has the capacity to seat 60 students, although for effective demonstration and practice, they will be dealt with in batches of 50-60 students. The first portion of the lab represents Cell physiology & body fluids portion, equipped with compound binocular microscopes & centrifuge machines. Next portion, representing blood physiology, is provided with Hemocytometers, Sahli's haemoglobinometer, ESR apparatus, teaching and projection microscopes. The lab also provides a distillation plant, hot air oven, physical balance & weighing machines. There are educational charts for theoretic reference. A cardio¬respiratory portion is equipped with Spirometers, Stethographs, Peak expiratory flow meters, ECG Machines, Sphygmomanometers & Ergometers. The lab is also provided with equipment to test special senses like perimeter, vision charts, fundoscope & tuning forks etc. A couch is placed in the lab for the practice of clinical methods.

DEPARTMENTAL GOALS

1. Demonstrate a knowledge of the major core concepts, theoretical underpinning and empirical findings of Biology (Content Goal)
2. Students will master the core concepts in ecology, physiology, cell physiology, molecular biology, evolution and genetics.
3. Understand and apply basic research methods, including experimental design, data analysis and interpretation. (Research Methods Goal)
4. Students will be able to design an experiment and understand its strengths and weaknesses.
5. Students will be able to select an appropriate method to test a hypothesis.
6. Students will be able to conduct a properly controlled experiment.

7. Students will be able to prepare reagents

Course Objectives

At the end of the course, the student should be able to understand:

1. **Cell Physiology**
    - Organization of the cell: membranous structure, organelles, nucleus
    - Functional systems of the cell: endocytosis, pinocytosis, phagocytosis, synthesis functions, exocytosis, energy production, cell movement & locomotion
    - Abnormalities of cell function and their clinical relevance

2. **Nerve-Muscle Physiology**
    - Transport of ions & molecules: diffusion, active transport
    - Membrane potential and action potential
    - Conduction of nerve impulses
    - Physiologic anatomy of skeletal and smooth muscle and mechanism of muscle contraction
    - Neuromuscular transmission
    - Common diseases such as myasthenia gravis

3. **Cardiovascular System**
    - Structure and physiology of cardiac muscle
    - Specialized excitatory & conduction system of the heart
    - Cardiac cycle, heart sounds
    - Regulation of heart pump
    - ECG basics, recording & interpretation; correlation of cardiac cycle with ECG and heart sounds
    - Cardiac arrhythmias
    - Circulation: pressure, flow & resistance
    - Functions of arterial & venous systems; microcirculation and lymphatic system
    - Control & regulation of blood flow
    - Regulation of peripheral vascular resistance
    - Arterial pulse
    - Regulation of venous return; arterial pressure regulation (short-term/long-term), hypertension types and consequences
    - Cardiac output regulation and measurement
    - Coronary circulation
    - Changes during exercise
    - Ischemic heart disease, cardiac failure, circulatory shock, heart murmurs, and echocardiography

4. **Blood Physiology**
    - Red blood cells: production, functions, regulation
    - Formation of hemoglobin, iron metabolism
    - Anemia & polycythemia
    - Production & functions of leukocytes
    - Blood groups, transfusion, transfusion reactions, tissue & organ transplantation
    - Hemostasis & blood coagulation: platelets, production, regulation, and functions
    - Thrombocytopenias
    - The clotting cascade
    - Hemophilia, Von Willebrand disease, Christmas disease
    - Bleeding time and clotting time

5. **Gastro-Intestinal System**

- General structure & organization
- Principles of GIT movements: mastication, deglutition
- Peristalsis: mechanism and control
- Vomiting: mechanism and control
- Defecation: mechanism and control
- Movements and functions of the stomach, small intestine, large intestine
- Secretory functions: saliva, gastric juice, pancreatic juice, intestinal juice, bile
- GIT hormones
- Digestion, absorption, and assimilation
- Functions of the liver: bilirubin formation & excretion, jaundice
- Liver function tests

6. **Renal Physiology**
   - Structure and functions of kidneys
   - Glomerular filtration: factors affecting and measurement
   - Renal blood flow
   - Urine formation, micturition
   - Renal regulation of blood volume & extracellular fluid volume
   - Regulation of acid-base balance

7. **Endocrine System**
   - General organization & importance of the endocrine system
   - Chemistry, synthesis, storage, functions, control, and abnormalities of pituitary, thyroid, parathyroid, pancreatic, and adrenal hormones
   - Hormonal assays and interpretation

8. **Nervous System**
   - General organization of the CNS
   - Synaptic transmission
   - Basic concepts of sensory, motor, and integrative functions of the nervous system, including various pathways
   - Cerebral blood flow and cerebrospinal fluid system
   - Physiology of pain with emphasis on endogenous pain control mechanisms
   - Organization and functions of the sensory cortex
   - Organization and functions of the motor cortex, pyramidal and extrapyramidal pathways
   - Presentation and interpretation of common upper and lower motor neuron lesions
   - Organization and functions of the cerebellum & basal ganglia; Parkinsonism disease
   - Thalamus: organization, nuclei, and functions
   - Functions of the hypothalamus
   - Temperature regulation
   - States of brain activity: sleep, brain waves, epilepsy & psychoses
   - Organization and functions of the autonomic nervous system
   - Special senses: elementary knowledge of the structure and physiology of special senses organs

Attendance Requirement & Internal Assessment Criteria

The institution follows the regulations for examinations of the UHS in letter and spirit. The students require **85% attendance** in all academic sessions and **50% marks** in internal assessments and send-up examinations to be eligible for the UHS Professional Examinations.



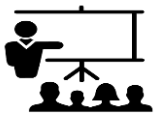
Learning Resources & Pedagogy

Book Recommendations



Sr.	Book Name	Author	Edition
1.	Textbook of physiology Guyton and Hall	Guyton and Hall	14th edition
2.	Review of medical physiology Ganong's	Ganong	23rd edition
3.	Physiology Linda S Costanzo	Linda S Costanzo	2nd revised edition
4.	Human physiology Vander, Sherman & Luciano	Vander, Sherman & Luciano	8th edition

Traditional & Innovative Teaching Methodologies



Sr.	Pedagogical Methodologies	Description
1.	Lectures	Traditional method where an instructor presents information to a large group of students (large group teaching). This approach focuses on delivering theoretical knowledge and foundational concepts. It is very effective for introducing new topics.
2.	Tutorial	Tutorials involve small group discussion (SGD) where students receive focused instruction and guidance on specific topics.
	Demonstrations	Demonstrations are practical displays of techniques or procedures, often used to illustrate complex concepts or practices, particularly useful in dental education for showing clinical skills.
3.	Practicals	Hands-on sessions where students apply theoretical knowledge to real-world tasks. This might include lab work, clinical procedures, or simulations. Practicals are crucial for developing technical skills and understanding the application of concepts in practice.
4.	Student Presentations	Students prepare and deliver presentations on assigned topics. This method enhances communication skills, encourages students to explore topics in-depth. It also provides opportunities for peer feedback and discussion.
5.	Assignment	Tasks given to students to complete outside of class. Assignments can include research papers, case studies, or practical reports. They are designed to reinforce learning, assess understanding, and develop critical thinking and problem-solving skills.

7.	Self-directed Learning	Students take initiative and responsibility for their own learning process. Students are encouraged to seek resources, set goals, and evaluate their progress. This is a learner-centered approach where students take the initiative to plan, execute, and assess their own learning activities. This method promotes independence, critical thinking, and lifelong learning skills.
8.	Flipped Classroom	In this model, students first engage with learning materials at home (e.g., through videos, readings) and then use class time for interactive activities, discussions, or problem-solving exercises. This approach aims to maximize in-class engagement and application of knowledge.
9.	Peer-Assisted Learning (PAL)	A collaborative learning approach where students help each other understand course material. PAL involves structured peer tutoring, study groups, or collaborative tasks. It enhances comprehension through teaching, reinforces learning, and builds teamwork skills.
10.	Team-based Learning (TBL)	A structured form of small group learning where students work in teams on application-based tasks and problems. Teams are responsible for achieving learning objectives through collaborative efforts, promoting accountability, and deeper understanding of the material.
11.	Problem-based Learning (PBL)	Students work on complex, real-world problems without predefined solutions. They research, discuss, and apply knowledge to develop solutions. PBL fosters critical thinking, problem-solving skills, and the ability to integrate knowledge from various disciplines.
12.	Academic Portfolios	A collection of student's work that showcases learning achievements, reflections, and progress over time. Portfolios include assignments, projects, and self-assessments. They provide a comprehensive view of student development, highlight strengths and areas for improvement, and support reflective learning (experiential learning)

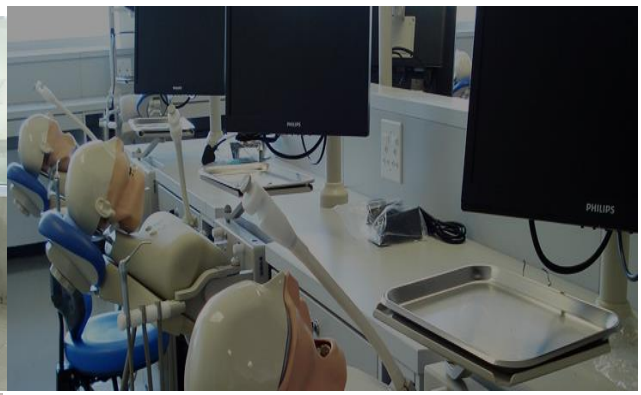


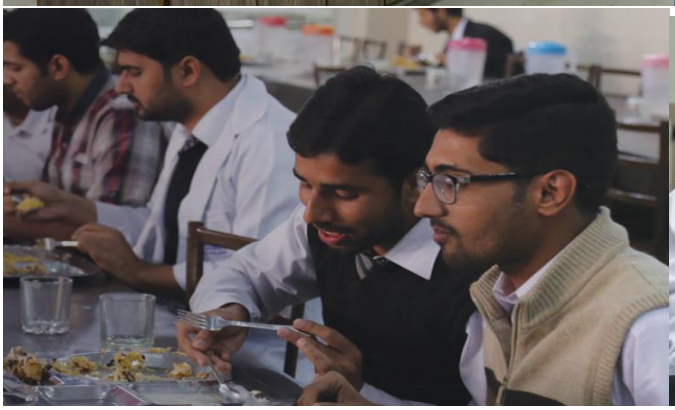
Flipped Classroom

Infrastructure Resources

Sr.	Infrastructure Resources	Description
1.	Lecture Hall	Each year has a dedicated lecture hall, totaling four lecture halls for the four professional years. These halls are equipped with modern audiovisual aids to support effective teaching and learning.
2.	Tutorial Room	The college's tutorial rooms, each with a capacity of 30, are specifically designed to support small group discussions and interactive sessions. These rooms facilitate personalized instruction, enabling more engaged and effective learning through direct interaction between students and instructors.
3.	Lab	The college is equipped with state-of-the-art laboratories for practical and clinical work. Each lab is designed to support various disciplines, to facilitate hands-on learning.
4.	Library on campus	A huge library occupies a full floor and has 260 seats including study carrels and group-discussion tables. Latest reference books, of Basic and Clinical Sciences along with national & international journals are available in the library.
5.	Digital Library	The digital library offers access to a vast collection of e-books, online journals, research databases, and other digital resources. It supports remote access and provides tools for academic research and learning.
6.	Learning Management System (LMS)	The LMS is a comprehensive online platform that supports course management, content delivery, student assessment, and communication. It provides tools for tracking progress, managing assignments, and facilitates ongoing academic activities.
6.	Phantom Labs	Specialized Phantom Labs are available for advanced simulation and practice in dental procedures. These labs provide high-fidelity models and simulators that help students refine their clinical skills in a controlled environment.
7.	Mess & Cafeteria	The College has its own on-campus Mess which caters to 600 students. All food items including dairy, meat, and vegetables are sourced organically and bought in at the time of cooking, in order to ensure that students get freshly cooked meals at all times Students form the Mess committee which decides the mess menu in consultation with other students. The Mess offers fresh food to all residents three times a day. However, day scholars are also welcome to use the Mess facility at a reasonable cost. Two 50- inch LCD screens provide students an opportunity to get entertained during their meal times.
8.	Gymnasium & Sports	We recognize sports as a pivotal key to shape and maintain students' personality and good health. The College has indoor and outdoor sports facilities to help enhance the cognition and capacity to learn. There is a proper sports section for various games like basketball, football, volleyball, and cricket.

		The gym itself is fully equipped with modern machinery both for students and faculty.
9.	IT Lab	The IT Lab is equipped with modern computers and software available for students who need access for academic purposes.
10.	Auditorium	The college has a spacious auditorium equipped with advanced audio-visual facilities. It is used for large-scale lectures, guest presentations, and academic conferences, providing a venue for students to engage with experts and participate in important educational events.
11.	Examination Halls	The college provides dedicated examination halls that are designed to accommodate a large number of students comfortably. These halls are equipped with necessary facilities to ensure a smooth and secure examination process, including proper seating arrangements, monitoring systems, and accessibility features.

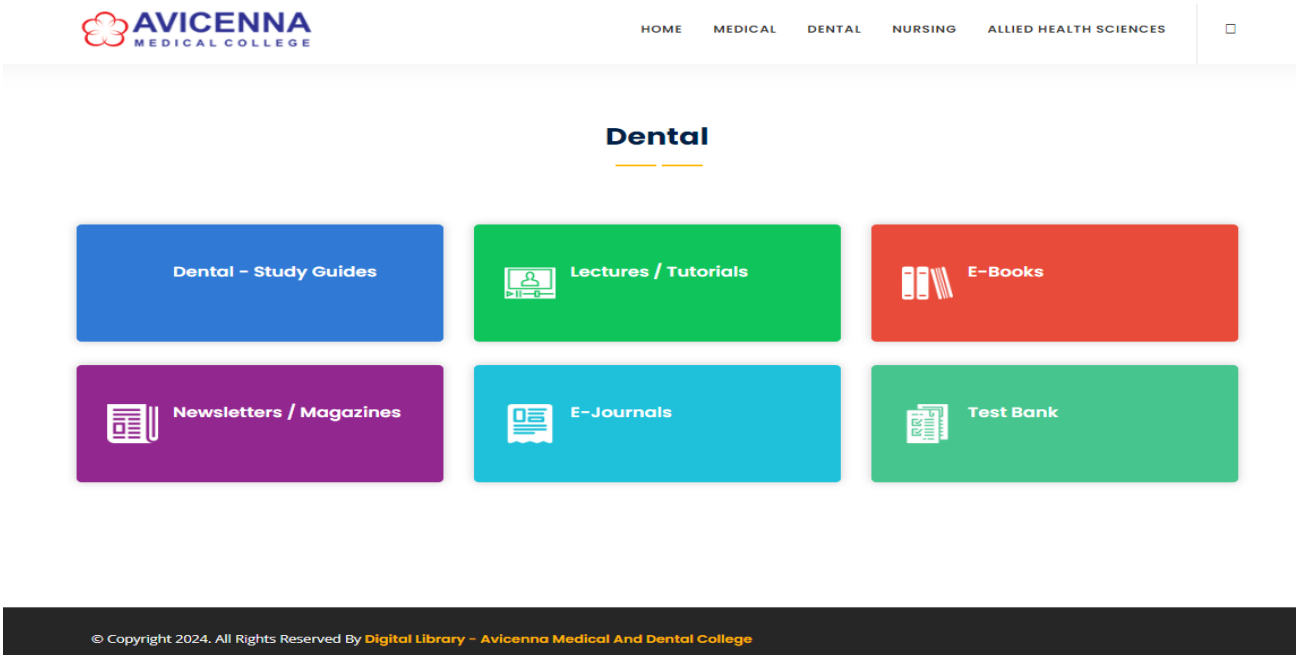





Digital Library & Learning Management System (LMS)

1. The COVID-19 pandemic highlighted the necessity of interactive online teaching for better retention of topics by students. Strategies like online learning management system (LMS), online discussions, online quizzes, assignment design, and flipped learning enhance student engagement in online education when needed.

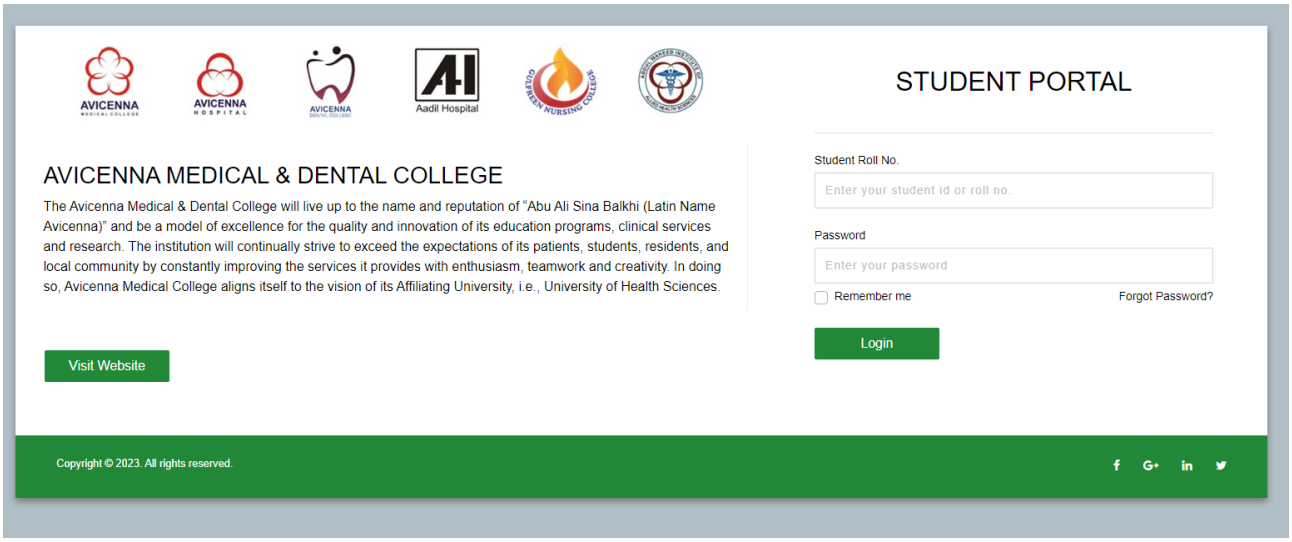
2. Avicenna Medical & Dental College lays emphasis on the provision of learning material and online video lectures, video tutorials in the e-library and learning resource center, which has a dedicated website of Avicenna Medical College to enable the students to develop concepts and clarify their doubts, if they have not been able to do so in the teaching sessions during college hours. The digital library can be approached on http://digital.avicennamch.com/.



3. The institution has also endeavored to link itself with the digital libraries and e-library of the University of Health Science (UHS) and Higher Education Commission (HEC) to enable the students to benefit from the valuable resource material, lectures and knowledge bank at these sites. The links are available with the HEC http://www.digitallibrary.edu.pk/ and learning management system of UHS http://lms.uhs.edu.pk .

4. The Learning Management System (LMS) at Avicenna Medical & Dental College is a comprehensive platform managed by the Department of Student Affairs. It is designed to facilitate effective communication and information exchange between students, parents, faculty, and administrative staff. The LMS portals are specifically tailored to meet the needs of the following stakeholders:

   a. **Students**: For academic resources and scheduling.
   b. **Parents:** For monitoring academic progress and other relevant information.
   c. **Faculty:** For managing course content and academic activities.
   d. **Department of Student Affairs:** For overseeing administrative functions.
   e. **Department of Medical/Dental Education:** For overseeing academic functions.



5. Students can access a comprehensive range of academic resources and information through the student portal. By logging in with their roll number and password, students can:

   - Look at their attendance and results.
   - Review academic activities and weekly timetables/schedules.
   - Access rotation planners and test schedules.
   - Check for any notification, assignment or resource material from their teachers.

6. The information to the parent is duplicated by the issuance of the password and login to the Students Learning Management System which is dedicated to the Academic Program of the students. The parents can view the following by logging in to the mobile app of Avicenna Student Management System:

   a) Syllabus
   b) Table of specifications
   c) Annual Planner
   d) Synopsis
   e) Block Time Table
   f) Weekly training program
   g) Allocation of Marks
   h) Assessment calendar
   i) Results of tests / exams*
   j) Students' attendance record
   k) Fees & fines

Assessment Guidelines

Assessment in dental education is a critical component designed to ensure that dental students acquire the necessary knowledge, skills, and competencies required for effective dental practice.

Assessment drives learning! – George E. Millar

You will encounter a variety of assessment methods, each serving a specific purpose.

- Written examinations, including multiple-choice and essay questions, will test your grasp of theoretical concepts and subject matter.
- Practical assessments will require you to demonstrate your clinical skills and ability to apply knowledge in real-world scenarios.
- Oral exams will evaluate your communication skills and reasoning abilities through case discussions and problem-solving exercises.
- Clinical skills and work-place based assessments will observe your hands-on proficiency and patient management capabilities.

At Avicenna Medical & Dental College, internal assessments are systematically conducted throughout each academic year of the BDS program, as per the guidelines established by the University of Health Sciences (UHS). These assessments, overseen by the Assessment Cell, adhere to either the Annual Subject-Based System or the Integrated/Modular System, depending on the curriculum structure.

Notably, beginning with the 2024-25 academic year, the weightage of internal assessments will be increased from 10% to 20%. The UHS administers professional examinations independently, organizing them at designated neutral sites and appointing external examiners to ensure objectivity and fairness.

Internal Assessment Weightage	10%	100 %
External Assessment Weightage	90%	



Internal Assessment Criteria

Internal Assessment	Assessment Methods	Percentage Weightage
Grand Tests	MCQs SEQs Viva OSPE	30%
Early Session Exam	MCQs SEQs Viva OSPE	70%
Mid Session Exam	MCQs SEQs Viva OSPE	
Send-up Exam	MCQ SEQ	100%
Total		200%

Reference attached on next page.

Avicenna Dental College

Examination Marks Scheme 2023-2024

1st Year BDS

Form No	BDS-1 Form-1		BDS-1 Form-2		BDS-1 Form-3		BDS-1 Form-4		BDS-1 Form-5		BDS-1 Form-6	
Test Type	Grand Test /Substage /Stage				Revision Test		Session Exam				Send Up	
Mode of Exam	Theory		Practical		Theory		Theory		Practical		Theory	
Weightage	(1,2)* 30%				0%		(3,4)* 70%				100%	
Anatomy 200 /Substage /Stage	MCQ 55, SEQ 45	100	Viva 25, OSPE 25	50	MCQ 20, SEQ 30	50	MCQ 45, SEQ 45, IA 10	100	Viva 45, OSPE 45, IA 10	100	MCQ 45, SEQ 45, IA 10	100
Physiology 200	MCQ 55, SEQ 45	100	Viva 25, OSPE 25	50	MCQ 20, SEQ 30	50	MCQ 45, SEQ 45, IA 10	100	Viva 35, OSPE 55, IA 10	100	MCQ 45, SEQ 45, IA 10	100
Biochemistry 100	MCQ 55, SEQ 45	100	Viva 25, OSPE 25	50	MCQ 20, SEQ 30	50	MCQ 21, SEQ 24, IA 05	50	Viva 25, Ospe 20, IA 05	50	MCQ 21, SEQ 24, IA 05	50
Oral Biology 200	MCQ 55, SEQ 45	100	Viva 25, OSPE 25	50	MCQ 20, SEQ 30	50	MCQ 45, SEQ 45, IA 10	100	Viva 60, OSPE 30, IA 10	100	MCQ 45, SEQ 45, IA 10	100

NOTE 1 : *If Viva/OSPE is held along with Theory test , The Theory test will get 15% weightage & VIVA / OSPE will get 15% Weightage in Grand Test

NOTE 2 : *If Viva/OSPE is not held for any reason Theory test will get full 30% weightage in Grand Test

NOTE 3 : *If Viva/OSPE is held along with Theory test , The Theory test will get 35% weightage & VIVA / OSPE will get 35% Weightage in Session Exam

NOTE 4 : * If Viva/OSPE is not held for any reason Theory test will get full 70% weightage in Session Exam

8/3/24

Department of Anatomy	Department of Biochemistry	Department of Physiology	Department of Oral Biology

Head of Examination Cell : Ijlal Zehra Zaidi

Chairman Avicenna:

Prof. Dr. Ijlal Zehra Zaidi
Head of Examination Department
Avicenna Medical & Dental College

14/3.

External Assessment

Paper Details		Assessment Methods	Total Marks	Percentage Weightage
Theory • 90 marks • 3 hrs	External Assessment	45 MCQs (1 mark each)	45 marks	50 %
		15 SEQs (3 marks each)	45 marks	
	Internal Assessment	See Internal Assessment Criteria	10 marks	
Practical • 90 marks • 3 hrs	External Assessment	Viva & OSPE	90 marks	50%
	Internal Assessment	See Internal Assessment Criteria	10 marks	
Total			200 Marks	100%

Sample Paper

MCQ

Mitosis is the separation of the duplicated genetic material carried in the nucleus. When two chromatids of each chromosome are pulled apart at the centromere, they form two separate sets of 46 daughter chromosomes.

Which of the following is the most likely stage of cell mitosis given in the above scenario?

a)Anaphase *
b)Cytokines
c) Metaphase
d) Prophase
e) Telophase

COGNITIVE LEVEL: Recall

DIFFICULTY LEVEL: Easy

IMPORTANCE: Must Know

REFERENCE: **Guyton & Hall, Chapter 3**

SEQ/SAQ

Q. A 30-year-old lady complains of diplopia, severe muscle weakness and fatigue. She has drooping eyelids and an enlarged shadow of thymus on ultrasound

Questions	**Marks**
A. What is the diagnosis?	**0.5**
B. What is the pathophysiologic basis of this disease?	**1.5**
C. Which medicine can alleviate lady symptoms?	**1**

Key	**Marks**
a)Myasthenia Gravis	
b) Myasthenia Gravis is an autoimmune disease in which skeletal muscles are weak and tire easily. • Patients develop antibodies that block or destroy their own acetylcholine receptors at the postsynaptic neuromuscular junction. • Inability of the neuromuscular junctions to transmit enough signals from the nerve fibers to the muscle fibers. • Normally, the number of quanta released from the motor nerve terminal declines with successive repetitive stimuli. • The end plate potentials that occur in the muscle fibers are mostly too weak to initiate opening of the voltage-gated sodium channels, and thus muscle fiber depolarization does not occur. • If the disease is intense enough, the patient may die of respiratory failure as a result of severe weakness of the respiratory muscles.	
c) The disease can usually be ameliorated for several hours by administering • neostigmine, • physostigmine	

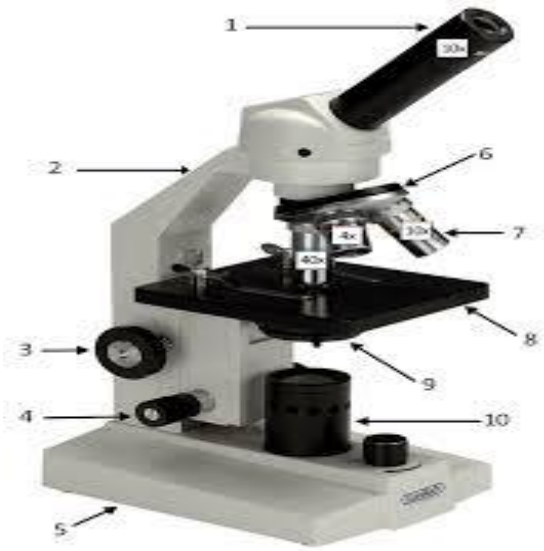
COGNITIVE LEVEL: Understand & Application

DIFFICULTY LEVEL: Moderate

IMPORTANCE: Must Know

REFERENCE: **Guyton Hall Chapter 7**

OSPE



a. Identify the labeled part 1 of the microscope ?

b. Write down any two types of microscopes?

Key:

a. Eye piece

(1)

b. 1) Compound microscope
2) Electron microscope

(1)

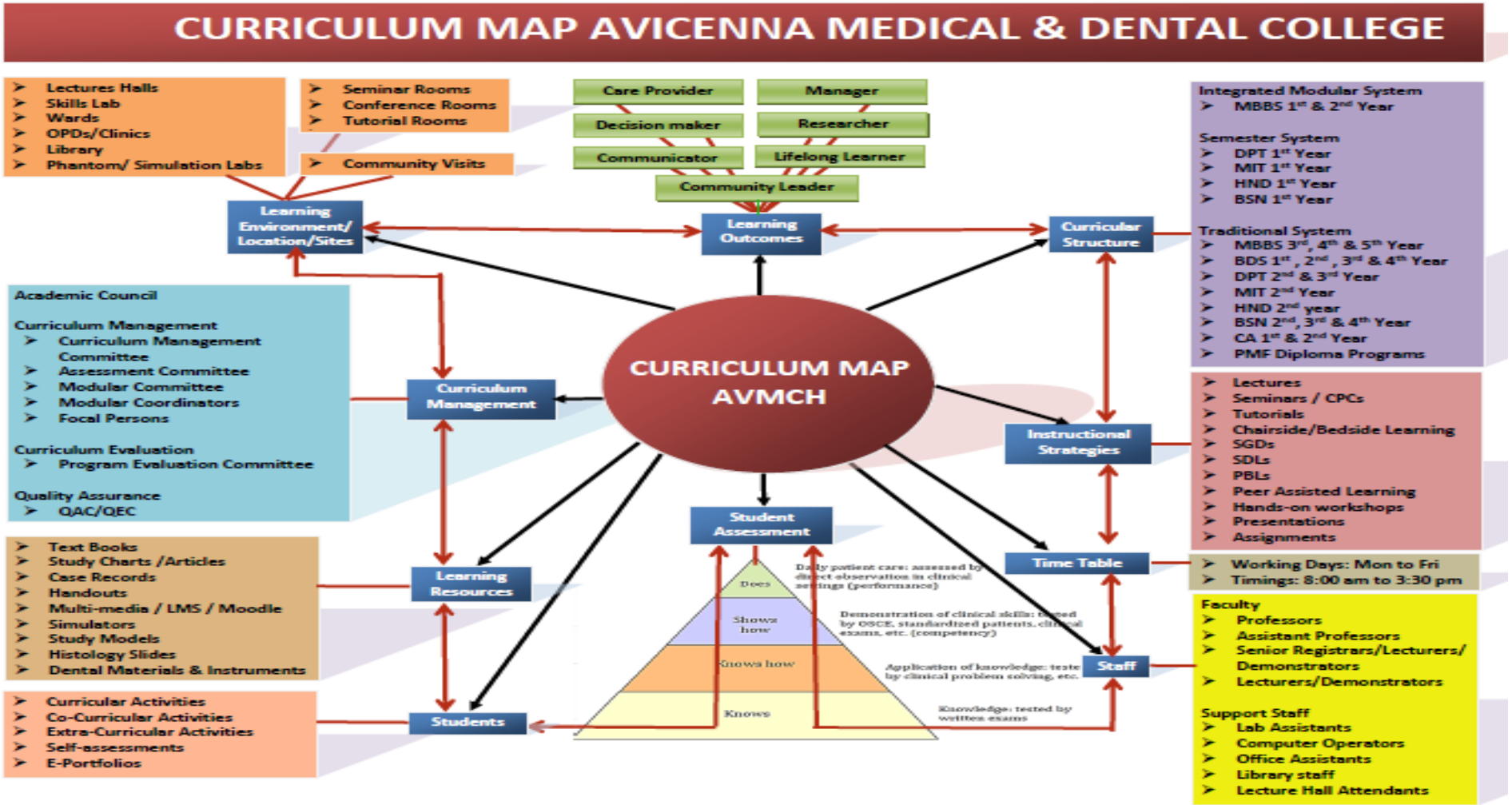
CURRICULUM DETAILS

Curricular Framework including allocation of hours (PMDC)

BDS SCHEME OF STUDIES			
Basic Dental Sciences / Preclinical Year		**Clinical Dental Sciences / Clinical Years**	
1st Professional Year	**2nd Professional Year**	**3rd Professional Year**	**4th Professional Year**
Anatomy 300 Hours	**General Pathology** 220 Hours	**General Medicine** 180 Hours	**Operative Dentistry** 250 Hours
Physiology 300 Hours	**Pharmacology** 220 Hours	**General Surgery** 170 Hours	**Prosthodontics** 250 Hours
Biochemistry 180 Hours	**Science of Dental Materials** 300 Hours	**Oral Pathology** 180 Hours	**Orthodontics** 250 Hours
Oral biology & Tooth Morphology 300 Hours	**Community Dentistry** 200 Hours	**Oral Medicine** 150 Hours	**Oral & Maxillofacial Surgery** 250 Hours
General Education 120 Hours (Islamiat, Pakistan Studies Behavioural Sciences, Research, English, Arts & Humanities)	**Preclinical Operative Dentistry** 80 Hours	**Periodontology** 180 Hours	**Paediatric Dentistry** 100 Hours
	Pre-clinical Prosthodontics 80 Hours	**Clinical Operative** 80 Hours	**General Education** 100 Hours (Research, English, Arts & Humanities, ICT)
	General Education 100 Hours (Behavioural Sciences, Research, English, Arts & Humanities, ICT)	**Clinical Prosthodontics** 80 Hours	
		Clinical Oral & Maxillofacial Surgery 80 Hours	
		General Education 100 Hours (Research, English, Arts & Humanities, ICT)	
1200 hours	**1200 hours**	**1200 hours**	**1200 hours**

Curricular Map & Rationale

1. This pictorial, vertical and horizontal presentation of the course content and extent shows the sequence in which various systems are to be covered. Curricular map to cover all the subjects and modules and the time allocated to study of the systems for the undergraduate programs offered at four colleges at campus are as follows:



Rationale 1st Professional Year	
Subjects	**Physiology**
TERM- I	● Homeostasis ● Cell and membrane ● Nerve and muscle, ● Blood Physiology, ● GIT ● Endocrinology
TERM- II	● CNS ● Heart ● Circulation
TERM-III	● Renal ● Respiration ● skin and temperature regulation, ● Ear and eye

Learning Outcomes

Unit/ Chapter	Topic/ Content	Student Learning Outcomes	Mode of Information (MOIT)	Learning Domain (KSA-Model)
Cell Physiology	1. Functional organization of Human Body, Homeostasis: and Control systems of the body 2. Structure of the Cell, Cell Membrane and its functions 3. Structures and Functions of Endoplasmic Reticulum, Golgi Apparatus, Lysosome, Peroxisomes 4. Mitochondria, Cell Cytoskeleton 5. Intercellular Connections, Locomotion of Cell and Autophagy 6. Transport of Substances Across the Cell: Simple and Facilitated Diffusion, Osmosis 7. Active Transport: Primary and Secondary Active Transport, Endocytosis 8. Basic Building Blocks of DNA, RNA, Transcription and Translation, Apoptosis and Cancer	**Student should be able to Understand** 1. Describe the Organization of the cell. 2. Describe Physical cellular characteristics: membranous structure, organelles, nucleus 3. Discuss Functional system of the cells 5. Describe Energy production, cell movement & locomotion 6. Discuss Abnormalities of cell function and their clinical relevance	Lecture,	Knowledge (Cognitive)

Cell Physiology	1. Use of Compound Microscope: Examination of Hair, Buccal Cells, Air Bubbles, Fat Globules, Sand Particles, Wool Fibre, Cotton Fibre	**Students should be able to Understand :** Use of Compound Microscope	Practical	Skill
Cell Physiology	Basic Building Blocks of DNA, RNA, Transcription and Translation, Apoptosis and Cancer	**Students should be able to** **Understand:** Basic Building Blocks	Tutorial	Knowledge
Cell Physiology	Transport of Substances Across the Cell: Simple and Facilitated Diffusion, Osmosis	**Students should be able to** Transport of Substances	Tutorial	Knowledge
Nerve & Muscle	1. neuron: structure & classification (histological & physiological) 2. Basic Physics of Membrane Potential, Nernst & Goldman equation,3. resting membrane potential, diffusion potential. 4.. Nerve impulse (Action potential), effects of various ions, 5. properties of nerve fibers, saltatory conduction & graded potential. 6. Physiological anatomy of skeletal muscles, general and molecular mechanism of muscle contraction. 7. Walk- along theory, Energetics of Muscle Contraction 8. characteristics and mechanics of whole muscle contraction, rigor mortis. 9. Physiological anatomy of neuromuscular junction	1. Discuss Transport of ions & molecules: diffusion, active transport 2. Differentiate between membrane potential and action potential; 3. Discuss Conduction of nerve impulses. 4. Describe Physiologic anatomy of skeletal and smooth muscles 5. Describe Mechanism of muscle contraction. 6. Discuss Neuromuscular transmission 7. Explain the mechanism behind common diseases like Myasthenia gravis	Lecture	Knowledge

	10. transmission of nerve impulse across neuromuscular junction, excitation-contraction coupling, myasthenia gravis. 11. Smooth Muscles: Types and Structure; RMP of Smooth Muscle, Action potential in smooth muscle, mechanical contraction, excitation contraction. 12. Latch Mechanism and nervous and hormonal control of smooth muscle contraction, comparison of skeletal, smooth and cardiac muscle fibers.			
Nerve & Muscle	Smooth Muscles: Types and Structure; RMP of Smooth Muscle, Action potential in smooth muscle, mechanical contraction, excitation contraction.	**Students should be able to** **Understand :** Smooth Muscles	Tutorial	Knowledge
Nerve & Muscle	Physiological anatomy of neuromuscular junction transmission of nerve impulse across	**Students should be able to** **Understand** Physiological anatomy of neuromuscular junction	Tutorial	Knowledge
Nerve & Muscle	Walk- along theory, Energetics of Muscle Contraction	**Students should be able to** **Understand:** Walk- along theory	Tutorial	Knowledge
Cardiovascular System	1. Physiologic Anatomy of Cardiac Muscle, Properties of myocardium---Action Potentials in Cardiac Muscle, Contractility, excitation contraction coupling 2. Cardiac Cycle-I: Pressure and Volume Changes in the Ventricles, heart sounds, atrial waves.	1. Physiologic Anatomy of Cardiac Muscle, Properties of myocardium---Action Potentials in Cardiac Muscle, Contractility, excitation contraction coupling	Lecture	Knowledge

	3. Graphical analysis of ventricular pumping: Regulation of Contraction of Ventricular Muscle 4. SA node action potential: SA node as pacemaker of heart 5. Control of excitation and conduction in heart, SA node as pacemaker, abnormal pacemakers of heart 6. Electrical properties of cardiac muscle, Normal ECG 7. Recording and interpretation of ECG, ECG leads, Abnormal ECG. 8. Cardiac arrhythmias, heart blocks, premature contractions, flutter and fibrillation, cardiac arrest. 9. Physical characteristics of circulation and its basic principles, inter-relationship of pressure, 10. blood flow and resistance, laminar and turbulent blood flow, resistance to blood flow, conductance of blood in vessels, Fourth- Power Law. 11. Vascular distensibility Vascular Compliance, Arterial pressure pulsations	2. Cardiac Cycle-I: Pressure and Volume Changes in the Ventricles, heart sounds, atrial waves. 3. Graphical analysis of ventricular pumping: Regulation of Contraction of Ventricular Muscle 4. SA node action potential: SA node as pacemaker of heart 5. Control of excitation and conduction in heart, SA node as pacemaker, abnormal pacemakers of heart 6. Electrical properties of cardiac muscle, Normal ECG 7. Recording and interpretation of ECG, ECG leads, Abnormal ECG. 8. Cardiac arrhythmias, heart blocks, premature contractions, flutter and fibrillation, cardiac arrest.		

	12. Veins and their functions, varicose veins 13. Structure of microcirculation and capillary system, Vasomotion, Diffusion through capillary membrane. 14. Structure of interstitium and interstitial fluid, fluid filtration- hydrostatic and colloid osmotic pressure, capillary filtration coefficient. 15. Starling forces, Exchange of Fluid Volume through the Capillary Membrane, Starling Equilibrium. 16. Lymphatic system (Lymph Channels of the Body, Formation of Lymph, Rate of Lymph Flow, Lymphatic Capillary Pump, Role of the Lymphatic System in Controlling Interstitial Fluid Protein Concentration, Interstitial Fluid Volume, and Interstitial Fluid Pressure) 17. Local and humoral control of blood flow – Acute Control of Local Blood Flow, vasodilator theory, oxygen lack theory, autoregulation by metabolic and myogenic mechanisms, endothelial derived constricting factors. 18. Local and humoral control of blood flow – Long-Term Local Blood Flow Regulation. Collateral circulation, humoral control of circulation 19. Nervous regulation of circulation, autonomic nervous system, vasomotor center 20. Short term regulation, Reflex Mechanisms for Maintaining Normal	9. Physical characteristics of circulation and its basic principles, inter-relationship of pressure, 10. blood flow and resistance, laminar and turbulent blood flow, resistance to blood flow, conductance of blood in vessels, Fourth- Power Law. 11. Vascular distensibility Vascular Compliance, Arterial pressure pulsations 12. Veins and their functions, varicose veins 13. Structure of microcirculation and capillary system, Vasomotion, Diffusion through capillary membrane. 14. Structure of interstitium and interstitial fluid, fluid filtration- hydrostatic and colloid osmotic pressure, capillary filtration coefficient. 15. Starling forces, Exchange of Fluid Volume through the Capillary Membrane, Starling Equilibrium. 16. Lymphatic system (Lymph Channels of the Body, Formation of Lymph, Rate of Lymph Flow, Lymphatic Capillary Pump, Role of the Lymphatic System in Controlling Interstitial Fluid Protein		

	Arterial Pressure, baroreceptor & chemoreceptor reflex, atrial reflex, CNS ischemic response, cushing reflex. 21. Renal-Body Fluid System for Arterial Pressure Control 22. Role of increased fluid volume on control of arterial pressure 23. The Renin-Angiotensin aldosterone system 24. Hypertension (Definition, types, causes, complications and treatment) 25. Intermediate regulation of BP (Renin-angiotensin vasoconstrictor system, stress relaxation, Capillary fluid shift mechanism) 26. Cardiac output and its regulation,Normal Values for Cardiac Output at Rest and During Activity, Frank-Starling mechanism, Cardiac Index, hyperactive, hypoactive heart. 27. Role of the Nervous System in Controlling Cardiac Output, low cardiac output and cardiac output curves 28. Venous return curve and regulation, Varicose veins 29. Total Peripheral resistance and its regulation 30. Control of Blood Flow in Skeletal Muscles at rest and during exercise 31. Coronary circulation and its regulation and ischemic heart disease. 32. Causes of death after acute coronary occlusion, stages of recovery and	Concentration, Interstitial Fluid Volume, and Interstitial Fluid Pressure) 17. Local and humoral control of blood flow – Acute Control of Local Blood Flow, vasodilator theory, oxygen lack theory, autoregulation by metabolic and myogenic mechanisms, endothelial derived constricting factors. 18. Local and humoral control of blood flow – Long-Term Local Blood Flow Regulation. Collateral circulation, humoral control of circulation 19. Nervous regulation of circulation, autonomic nervous system, vasomotor center 20. Short term regulation, Reflex Mechanisms for Maintaining Normal Arterial Pressure, baroreceptor & chemoreceptor reflex, atrial reflex, CNS ischemic response, cushing reflex. 21. Renal-Body Fluid System for Arterial Pressure Control 22. Role of increased fluid volume on control of arterial pressure 23. The Renin-Angiotensin aldosterone system 24. Hypertension (Definition, types, causes, complications and treatment)		

	treatment of IHD33. Cardiac failure, compensated, decompensated heart failure. 34. Edema in cardiac failure patients, cardiogenic shock, cardiac reserve. 35. Heart sounds, valvular heart diseases. 36. Congenital heart diseases, tetralogy of Fallots, patent ductus arteriosus, cardiac hypertrophy 37. Circulatory shock, stages of shock and types of shock.	25. Intermediate regulation of BP (Renin-angiotensin vasoconstrictor system, stress relaxation, Capillary fluid shift mechanism) 26. Cardiac output and its regulation,Normal Values for Cardiac Output at Rest and During Activity, Frank-Starling mechanism, Cardiac Index, hyperactive, hypoactive heart. 27. Role of the Nervous System in Controlling Cardiac Output, low cardiac output and cardiac output curves 28. Venous return curve and regulation, Varicose veins 29. Total Peripheral resistance and its regulation 30. Control of Blood Flow in Skeletal Muscles at rest and during exercise 31. Coronary circulation and its regulation and ischemic heart disease. 32. Causes of death after acute coronary occlusion, stages of recovery and treatment of IHD33. Cardiac failure, compensated, decompensated heart failure. 34. Edema in cardiac failure patients, cardiogenic shock, cardiac reserve. 35. Heart sounds, valvular heart diseases.		

		36. Congenital heart diseases, tetralogy of Fallots, patent ductus arteriosus, cardiac hypertrophy 37. Circulatory shock, stages of shock and types of shock.		
Cardiovascular System	Congenital heart diseases, tetralogy of Fallots, patent ductus arteriosus, cardiac hypertrophy	**Students should be able:** **Understand** : Congenital heart diseases	Tutoria	Knowledge
Cardiovascular System	Circulatory shock, stages of shock and types of shock.	**Students should be able:** Understand shock	Tutorial	Knowledge
Cardiovascular System	Edema in cardiac failure patients, cardiogenic shock, cardiac reserve.	**Students should be able:** **Understand:** cardiogenic shock	Tutorial	Knowledge
Cardiovascular System	1. ECG 1 2.Arterial pulse 3. Determination of Blood Pressure in Man 4. Clinical examination of precordium	**Students should be able** **Understand:** Cardiovascular system	Practical	Skill
Blood Physiology	Composition and functions of blood 2.Plasma proteins 3. Production of RBCs (erythropoiesis): Site, Stages, and Regulation 4. Hemoglobin: Structure, Synthesis, Functions, and Derivatives Hemoglobinopathies	1. Describe the production, functions and regulation of Red blood cells 2. Explain the formation of hemoglobin, iron metabolism, Anemia & polycythemia	Lectures	Knowledge

	Iron metabolism 5.Anemia,classification, signs and symptoms, effects on circulation. Polycythemia 6. WBCs: Types, Genesis (Stages of Development, Site of Production), Normal Count, Life span, and Functions 7. Monocyte – Macrophages System RES (Mobile & fixed macrophages) Functions of macrophages 8. Inflammation: Lines of Defense Leukopenia, Leukocytosis, Leukemia, Lymphopenia 9. Immunity: Introduction, classification, Innate immunity, acquired immunity. 10. humoral immunity & antibodies 11. cell mediated immunity 12. Allergy—definition, types Hypersensitivity reactions 13. Blood Groups: Types, ABO & Rh systems, Erythroblastosis fetalis. 14. cross-matching, transfusion reactions and its types, tissue and organ transplantation. 15. Hemostasis Stages. Platelet Plug, mechanism of blood coagulation. 16. extrinsic and intrinsic pathways for initiating clotting 17. prevention of blood clotting-intravascular anticoagulants, lysis of blood clots 18. Bleeding disorders, Anticoagulants, Blood coagulation tests.	3. Discuss the production & enlist functions of leukocytes 4. State the types of Blood groups, transfusion, transfusion reactions, tissue & organ transplantation 5. Discuss Hemostasis & blood coagulation, Platelets, production, regulation and functions, and Thrombocytopenias 6. Describe The clotting cascade and explain bleeding time and clotting time 7. Describe the mechanism behind diseases like Hemophilia, Von Willbrand disease, and Christmas disease		

Blood Physiology	Bleeding disorders, Anticoagulants, Blood coagulation tests.	**Students should be able**: **Understand:** Bleeding disorders,	Tutorial	Knowledge
Blood Physiology	Prevention of blood clotting- intravascular anticoagulants, lysis of blood clots	**Students should be able:** **Understand:** Prevention of blood clotting	Tutorial	Knowledge
Blood Physiology	Hemostasis Stages. Platelet Plug, mechanism of blood coagulation	**Students should be able**: **Understand:** Hemostasis	Tutorial	Knowledge
Blood Physiology	1. Study of Haemocytometer and How to Collect Blood Sample 2. Determination of RBC Count 3. Determination of TLC Count 4. Estimation of Haemoglobin by Sahle's Method 5. Perform Differential Leucocyte Count of Your Own Blood 6. Determination of ESR	**Students should be able Understand :** Blood Sample	Practical	Skill
Gastro-intestinal System	1. Physiological anatomy of GIT, Electrical activity, slow wave and spike potential, Enteric nervous system. 2. Functional types of movements in the gastrointestinal tract, splanchnic circulation 3. Ingestion of food, . Movements of small intestine and colon, defecation reflex, GI	**Student should be able to Understand :** 1. Describe the general structure & organization of the GIT 2. State the Principles of GIT movements, Mastication, deglutition 3. Illustrate Peristalsis mechanism and control	Lecture	Knowledge

	secretions,Motor functions of the stomach 4.Gastric secretions 5. GIT disorders 6. Introduction and basic characteristics of ANS, receptors, Pharmacology of ANS. Autonomic reflexes 7.Sympathetic and Parasympathetic system fibers,Neurotransmitters	4. Enumerate the steps of Vomiting mechanism and control 5. Understand Defecation mechanism and control 6. Recall the Movements and functions of stomach, small intestine, large intestine 7. Understand Secretory functions (saliva, gastric juice, pancreatic juice, intestinal juice, & bile) 8. Learn GIT hormones, Digestion & absorption & assimilation 9. Explain the functions of liver & detail bilirubin formation & excretion 10. Explain Jaundice and the importance of Liver function tests		
Gastro-intestinal System	Gastric secretions	**Students should be able Understand :** Understand Gastric secretions	Tutorial	Knowledge
Autonomic Nervous system	Introduction and basic characteristics of ANS, receptors, Pharmacology of ANS. Autonomic reflexes	**Students should be able Understand :** Understand Introduction and basic characteristics of ANS,	Tutorial	Knowledge
Autonomic Nervous system	Sympathetic and Parasympathetic system fibers,Neurotransmitters	**Students should be able Understand :** Understand Sympathetic and Parasympathetic system	Tutorial	Knowledge
Renal Physiology	1. Body fluid compartment 2. Regulation of fluid exchange 3. Clinical abnormalities of fluid volume 4. Edema, Nephrotic Syndrome	**Student should be able to Understand** : 1. Describe the Structure and functions of kidneys	Lecture	Knowledge

	5. Functions of Kidney, Micturition, Micturition reflex and its abnormalities 6. GFR & its determinants 7. Renal blood flow & its determinants 8. Tubular reabsorption with active mechanism and passive mechanism 9. reabsorption and secretion along different parts of nephron and its regulation 10. Clearance method to quantify renal function 11. Formation of dilute and concentrated urine 12. Countercurrent multiplier and exchange 13. ECF osmolarity and Na concentration 14. Diuretics and their mechanisms	2. Define Glomerular filtration, factors affecting it and measurement 3. Define and calculate Renal blood flow 4. Identify the steps of Urine formation, micturition reflex and its control 5. Describe the Renal regulation of blood volume & extracellular fluid volume 6. Discuss types of regulation of acid-base balance		
Renal Physiology	Countercurrent multiplier and exchange	**Student should be able to Understand** Countercurrent	Tutorial	Knowledge
Renal Physiology	ECF osmolarity and Na concentration	**Student should be able to Understand** : ECF osmolarity	Tutorial	Knowledge
Renal Physiology	Diuretics and their mechanisms	**Student should be able to Understand :** Diuretics	Tutorial	Knowledge

EndoCrine System	1. Chemical messengers 2. Hormone secretion, transport, and clearance from the blood,Intracellular signaling, Pituitary Hormones 3. Growth Hormone & its abnormalities 4. Functions of posterior pituitary hormones 5. Synthesis, secretion & metabolic functions ofThyroid Hormone 6. Regulation of thyroid hormone and diseases of thyroid 7. Synthesis and secretion of ACTH 8.Functions of Aldosterone & cortisol, Abnormalities of ACTH secretions 9. Insulin, secretion & its metabolic effects 10. Glucagon and somatostatin functions 11. Diabetes mellitus - type 1 & type 2 12. Ca+ & PO4- regulation in ECF & plasma 13. Bone physiology & Vit. D 14. Parathyroid hormone 15. Calcitonin	**Student should be able to Understand :** 1. Discuss General organization & importance of endocrine system. 2. Describe Chemistry, synthesis, storage, functions, control, and abnormalities of pituitary, thyroid, parathyroid, pancreatic, and adrenal hormones. 3. Illustrate Hormonal assays and interpretation	Lecture	Knowledge
EndoCrine System	Ca+ & PO4- regulation in ECF & plasma	**Student should be able to Understand :**	Tutorial	Knowledge

		Understand Regulation in ECF		
EndoCrine System	Parathyroid hormone	Parathyroid hormone function	Tutorial	Knowledge
EndoCrine System	Glucagon and somatostatin functions	**Student should be able to** **Understand:** Glucagon and somatostatin functions	Tutorial	Knowledge
Respiration	1. Organization and Functions of the Respiratory System Respiratory unit-Dead space Blood supply of lungs- Pulmonary circulation, bronchial circulation 2. Mechanics of Pulmonary Ventilation 3. Compliance of the Lungs, surfactant, work of breathing 4. Lung Volumes and Capacities, spirometry, FEV1/FVC, physiologic shunt Minute Respiratory Volume 5. Alveolar ventilation Dead Space" and Its Effect on Alveolar Ventilation, Measurement of the Dead Space Volume, Functions of the Respiratory Passageways 6. Functions of respiratory passages, cough reflex, sneez reflex, vocalization, phonation 7. Pressures in the Pulmonary System, Blood Volume of the Lungs, Blood flow through lungs, Pulmonary capillary dynamics, pulmonary edema, fluid in pleural cavity	**Student should be able to Understand :** 1. Discuss Pulmonary ventilation, Pulmonary circulation, pulmonary edema, and pleural fluid. 2. Enlist the Principle of gas exchange; diffusion of oxygen and carbon dioxide through the respiratory membrane 3. Recall the steps of Transport of oxygen and carbon dioxide in blood and tissue fluids.	Lecture	Knowledge

	8. Physics of Gas Diffusion and Gas Partial Pressures, Laws of gas diffusion, composition of alveolar & atmospheric air. 9. Respiratory Membrane, Gas Diffusion through the Respiratory Membrane, its Diffusing Capacity,Measurement of Diffusing Capacity-the Carbon Monoxide Method, ventilation perfusion ratio 10. Oxygen transport, oxygen hemoglobin dissociation curve, factors shifting oxygen-hemoglobin dissociation curve. 11. Carbon Dioxide transport, Haldane Effect, Carbon Dioxide Dissociation Curve, respiratory exchange ratio 12. Nervous control of respiration 13. chemical control of respiration 14. Regulation of Respiration during Exercise, factors affecting respiration, Cheyne Stokes breathing 15. Respiratory insufficiency/diseases, hypoxia, cyanosis, hypercapnia, dyspnea, artificial respiration 16. Aviation, acute and chronic mountain sickness. Space physiology 17. Deep sea diving			
Respiration	Aviation, acute and chronic mountain sickness. Space physiology	**Student should be able to Understand**	Tutorial	Knowledge

		Understand mountain sickness		
Respiration	Deep sea diving	**Student should be able to Understand** Understand Deep sea diving	Tutorial	Knowledge
Respiration	Respiratory insufficiency/diseases, hypoxia, cyanosis, hypercapnia, dyspnea, artificial respiration	**Student should be able to Understand** Understand Respiratory diseases,	Tutorial	Knowledge
Respiration	1. Determination of Various Lung Volumes and Capacities by Spirometry 2. Study Respiratory Movements by Stethograph	**Student should be able to Understand** Understand Respiratory Volumes	Practical	Skill
Skin and body Temperature	1. Types of Body temperature; Mechanisms and regulation of temperature, set point 2. Abnormalities of temperature regulation, Pyrexia,chills, heat stroke, flush, acclimatization, exposure to extreme cold, hypothermia	**Student should be able to Understand :** 1. Describe Aviation, high altitude, and space physiology 2. Discuss physiology of deep-sea diving and other hyperbaric conditions. 3. Explain body temperature regulation and fever	Lecture	Knowledge
Skin and body Temperature	Abnormalities of temperature regulation, Pyrexia,chills, heat stroke, flush, acclimatization, exposure to extreme cold, hypothermia	**Student should be able to Understand** Abnormalities of temperature regulation,	Tutorial	Knowledge

Central Nervous system and Special senses	[1:24 am, 29/08/2024] Dr. Nida (AP) Physiology BDS: 1. General Organization of CNS, receptors, synapses & their types, synapse transmission, effects of dendrites 2. Properties & transmitters of Synapses, Synaptic delay, special characteristics of synaptic transmission 3. Sensory receptors and classification, Mechanism of receptors functioning 4.. Transmission of signals of different intensity in nerve tract, transmission & signal processing through neuronal pool. 5. Somatic sensation of different types of receptors 6. Transmission in the dorsal column-medial lemniscal system 7. Transmission in the anterolateral pathway 8. Somatosensory cortex and functions, vibratory, position sensation 9. Pain, types of pain, receptors, dual pathway of transmission, analgesia system 10. Referred pain, visceral pain, abnormalities of pain, thermal sensations	**Student should be able to Understand :** 1. Discuss General organization of CNS Synaptic transmission 2. Enlist the Basic concepts of sensory, motor and integrative 3. Describe the functions of the nervous system including various pathways 4. Define Cerebral blood flow and cerebrospinal fluid system 5. Recall the Physiology of pain with emphasis on endogenous pain control mechanisms 6. Discuss Organization and functions of sensory cortex Organization and function of cerebral cortex 8. Explain the presentation and interpretation of common upper and lower motor neuron lesions 9. Enlist Organization and functions of cerebellum & basal ganglia, parkinsonism disease. 10. Discuss the organization, nuclei, and functions of the Thalamus 11. Enlist Functions of hypothalamus12. Explain Temperature regulation 13. Describe States of brain activity: sleep brain waves, epilepsy, & psychoses.	Lecture	Knowledge

	11. Physical principles of optics and refractive principals to lenses, errors of refraction. 12. Accomodation and its mechanism, presbyopia,visual acuity fluid system of the eye, 13. Physiologic anatomy of retina, rhodopsin cycle- retinal visula cycle, excitation of rods, visual pathways and its lesions, light and dark adaptation 14. Colour Vision, tricolor mechanism of color detection, neural functions of retina 15. Organization and function of visual cortex, color detection 16. Autonomic control of accommodation and pupillary aperture, eye movements 17. Tympanic membrane and ossicular system, functions of middle ear 18. Cochlea, functions of organ of corti, Place principle, determination of loudness 19. Central auditory mechanisms, auditory nervous pathway, hearing abnormalities 20. Sense of taste, Primary sensation of taste, sense of smell, olfactory receptors and it's pathway. 21. Organization of the spinal cord for motor functions, muscle spindle stretch reflex, role of golgi tendon organ in muscle control. 22. Role of the muscle spindle in voluntary motor activity clonus-oscillation- muscle jerks, flexor reflex and withdrawal reflex	14. Enlist Organization and functions of autonomic nervous system 15. Explain the structure and physiology of Special sense organs		

	23. Motor cortex & corticospinal tract 24. Transmission of signals from cortex to muscles 25. Vestibular sensation 26. Cerebellum and its motor functions, neuronal circuit 27. Basal Ganglia and motor functions and lesions 28. Physiologic anatomy of cerebral cortex 29. Werinke's area & Broca's area 30. Functions of corpus callosum (thought, consciousness & memory) 31. Activating the driving system of the brain, limbic system & hypothalamus. 32. Sleep, two types of sleep, basic theories of sleep, 33. Brain waves, EEG 34. Epilepsy 35. CSF blood flow & blood brain barrier, cerebral edema			
Central Nervous system and Special senses	Sleep, two types of sleep, basic theories of sleep	**Student should be able to Understand** Sleep	Tutorial	Knowledge
Central Nervous system and Special senses	Activating the driving system of the brain, limbic system & hypothalamus.	**Student should be able to Understand** Activating the driving system of the brain,	Tutoria	Knowledge

Central Nervous system and Special senses	Transmission of signals from cortex to muscles	**Student should be able to Understand** Transmission of signals from cortex to muscles	Tutoria	Knowledge
Central Nervous system and Special senses	Central auditory mechanisms, auditory nervous pathway, hearing abnormalities	**Student should be able to Understand** Central auditory mechanisms,	Tutoria	Knowledge
Central Nervous system and Special senses	1. Examination of Sensory system 2. Clinical Examination of cranial nerve V 3. Clinical Examination of cranial nerve VII 4. Clinical Examination of cranial nerve VIII 5. Clinical Examination of cranial nerve I 6. Clinical Examination of cranial nerve III, IV,VI 7. Clinical Examination of Visual acuity 8. Examination of Field of vision Perimetry 9. Examination of Color Vision 10. Examination of Body temperature 11. Clinical Examination of cranial nerve XII 12. Examination of Motor system 13. Examination of power of muscles 14. Examination of Superficial reflexes 15. Examination of Deep reflexes 16. Examination of Coordination test 17. Examination of Patellar and ankle Clonus 18. Clinical Examination of cranial nerve IX, X, XI	**Student should be able to Understand** Examination of Sensory system and cranial nerves	Practical	Skill

Total

Assessment TOS/Blueprint

Unit/ Chapter	Assessment Method (No. of Questions)			
	MCQS	SEQs	**Viva**	**OSPE**
Cell Physiology	4	1	Possible Question	Possible Question
Nerve & Muscle	6	2	Possible Question	Possible Question
Cardiovascular System	5	2	Possible Question	Possible Question
Blood Physiology	7	2	Possible Question	Possible Question

Gastro- intestinal System	1	1	Possible Question	Possible Question
Autonomic Nervous system				
Renal Physiology	4	1	Possible Question	Possible Question
EndoCrine System	3	1	Possible Question	Possible Question
Endocrine System				
Respiration	5	2	Possible Question	Possible Question
Skin and body Temperature				
Central Nervous system and Special senses	10	3	Possible Question	Possible Question
Total	45	15		


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