



**MUHAMMAD MEDICAL
COLLEGE**

IBN-E-SINA UNIVERSITY

MIRPURKHAS

**STUDY GUIDE FIRST
PROFESSIONAL
MBBS**



BATCH ¹ 2024-25
ACADEMIC SESSION 2024-25

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ABBREVIATIONS	
Foundation	FND
Hematology	HEM
Respiratory	RESP
Cardiovascular	CVS
Musculoskeletal	MSK
Pathology	PATH
Pharmacology	PHARM
Medicine	MED
Surgery	SURG
Pediatrics	PAEDS
Community Medicine	CM
Gynecology & Obstetrics	GYNAE & OBS
Cardiology	CARDIO
Spiral	S
Best Choice Questions	BCQS
Bedside Teaching	BST
Case Based Learning	CBL
Curriculum Committee	CC
Clinical Rotation	CR
Clinical Skills Foundation Rotations	C-FRC
Clinical Pathological Conference	CPC
Class Quiz	CQ
Class Representation	CR
Continuous Medical Education	CME
Directed Self-Learning	DSE
House Officers	HO
Head Of Department	HOD
Higher Education Commission	HEC
Large Group Integrated Teaching	LGIT
Modes of Information Transfer	MIT
Objective Structured Practical Examination	OSPE
Objective Structured Clinical Examination	OSCE
Objective Structured Viva Examination	OSVE
Problem-Based Learning	PBL

Professionalism, Ethics, Research, Leadership Skills	PERLS
Patient Management Problem	PMP
Problem Solving Integrated Learning	PSIL
Pakistan Medical & Dental Council	PM&DC
Practical Work	PW/LAB
Quality Enhancement Cell	QEC
Self-Study	SS
Skills Lab	SL
Small Group Discussion	SGD
Simulation	SIM
Short Essay Questions	SEQS
University Of Health Sciences	UHS
Team Based Learning	TBL
Ward Based Teaching	WBT
Work Placed Based Assessment	WPBA

ACADEMIC CALENDAR Academic Session 2024-2025		
Activity	Class Year	Dates
Classes starts	First Prof MBBS	February 18, 2025
Eid-ul-Fitr	Holiday	March 31 to April 06, 2025
Classes Resumes	All Batches of MBBS	April 07, 2025
Summer Vacation	1 st to 4 th Year MBBS	June 07 to July 06, 2025
Classes Resumes	All Batches of MBBS	July 07, 2025
Classes Ends	First Year MBBS	November 14, 2025
Exam Preparation	First Year MBBS	November 15 to December 07, 2026
Annual Examination	First Year MBBS	December 08 to January 04, 2026

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MISSION STATEMENT OF MMC & VISION OF ISU/MMC & LUMHS

MISSION STATEMENT OF MUHAMMAD MEDICAL COLLEGE

Nurturing students' potential by providing them the highest quality education, thereby producing individuals with strong values, compassion, inclusiveness, leadership, and professionalism, emphasizing community engagement, particularly with marginalized segments of the rural population, encouraging students to become empathetic and socially responsible professionals by training them in the best evidence-based practice, capable of contributing to advancements through research and innovation.

VISION OF ISU

To be an internationally recognized institution, famous for its ethical work, emphasizing the importance of integrity, honesty, and moral principles, highlighting the University's commitment to serving the community and producing unbiased and empathetic educated people, who are inclusive and have leadership skills, encouraging them to engage in research, critical thinking, innovation, and evidence-based best practices.

VISION OF LIAQUAT UNIVERSITY OF MEDICAL AND HEALTH SCIENCES (LUMHS)

Liaquat University of Medical and Health Sciences (LUMHS) seeks to be a top-tier healthcare Institution, producing ingenious academic leaders, medical researchers, and healthcare advocates to serve global community.

MBBS PROGRAM OUTCOME

By the end of the five years of the MBBS program at MUHAMMAD MEDICAL COLLEGE, aims to produce Medical graduates who are able to:

1. Utilizing knowledge of basic and clinical sciences for patient care.
2. Acquiring an integrated knowledge of organ, structure, function and its regulatory mechanism through the end of integrated teaching.
3. Achieving competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
4. Exhibit ethical patient-centered care based on Integrity, humility, social accountability and high ethical values of this sacred profession
5. Becoming exemplary citizen by observing medical ethics and fulfilling social and professional obligations, responding to national aspirations.
6. Taking focused history, performing physical examination, formulating diagnosis and management plan for common health problems.
7. Demonstrating professional behaviors that embody lifelong learning, altruism, empathy and cultural sensitivity in the provision of healthcare services.
8. Engage in research activity aimed at improvement of quality of health care including behavior modification of individual and community for quality life.
9. Identifying problems, critically reviewing literature and disseminating knowledge.
10. Developing scientific temper by acquiring continuous educational experience for proficiency in profession and promoting healthy living of the individual and population at large by critically analyzing the situation.
11. Committing to lifelong learning to keep up to date with developments in clinical practice and trends in disease at population level by strong leadership and management skills.
12. Applying evidence-based practices for protecting, maintaining and promoting the health of individuals, families and community.

TEACHING FACULTY	
DEPARTMENT OF ANATOMY	
PROFESSORS	
01	Prof. Dr. Abdul Latif Panwher {CHAIRPERSON}
ASSOCIATE PROFESSORS	
02	Dr. Saqib Baloch
03	Dr. Shahab Hanif
ASSISTANT PROFESSORS	
04	Dr. Asadullah Palli
05	Dr. Muhammad Raheem Bhurguri
06	Dr. Ayesha Asad
LECTURERS/ DEMONSTRATORS	
07	Dr. Hira Anwar
08	Dr. Shaukat Ali Awan
09	Dr. Zulfiqar Mari
10	Dr. Huma Shabbir
11	Dr. Muhammad Furqan
12	Dr. Nuzhat
13	Dr. Suha Marukh
14	Dr. Musarat Manzor

DEPARTMENT OF BIOCHEMISTRY	
PROFESSORS	
01	Prof. Dr. Abdul Shakoor Memon {CHAIRPERSON}
02	Prof. Dr. Shamsul Arfeen Khan
03	Prof. Dr. Naveed Ali Siddiqui
04	Prof. Dr. Shah Muhammad Mahesar
ASSISTANT PROFESSORS	
05	Dr. Arsalan Nazamani
LECTURERS/ DEMONSTRATORS	
06	Dr. Syed Saqib Tauqeer
07	Dr. Tufail Ahmed Memon
08	Dr. Sumbul
09	Dr. Arshad Nihal
10	Dr. Ghulam Muhammad Jinjhi
11	Dr. Aneela
12	Dr. Ramhsa Saleem

DEPARTMENT OF PHYSIOLOGY	
PROFESSORS	
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02	Prof. Dr. Zafar H. Tanveer
03	Prof. Dr. Abdullah Abbasi

04	Prof. Dr. Syed Farhan ud Din
ASSOCIATE PROFESSOR	
05	Dr. Shafaq Ansari
ASSISTANT PROFESSORS	
06	Dr. Muhammad Amin Memon
07	Dr. Naila Noor

LECTURERS/ DEMONSTRATORS	
08	Dr. Nadeem Iqbal
09	Dr. Muhammad Imran Ishtiaq
10	Dr. Parshotam
11	Dr. Hafsa Iqbal Pathan
12	Dr. Nida Saifullah
13	Dr. Rabel
14	Dr. Mahwish Anwar
15	Dr. Noor-ul-Huda Sheikh
16	Dr. Asha Bai

DEPARTMENT OF PATHOLOGY	
PROFESSORS	
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02	Prof. Dr. Amtul Hussain Jafri
03	Prof. Dr. Muhammad Farooq Baig
04	Prof. Dr. Darya Khan
05	Prof. Dr. Riaz Ahmad Qazi
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ASSOCIATE PROFESSOR	
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09	Dr. Aneela Faisal Memon
10	Dr. Ali Abuzar Raza
11	Dr. Sumair Akbar Ali
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13	Dr. Sana Lund Baloch
14	Dr. Ubaid Rabani
15	Dr. Haider Ali
16	Dr. Humair Javaid
17	Dr. Tehreem Fatima
18	Dr. Syed Raza Muhammad
19	Dr. Syeda Masooma Zehra

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02	Prof. Dr. Allah Bachayoo Rajar
ASSOCIATE PROFESSOR	
03	Dr. Amjad Azam
ASSISTANT PROFESSORS	
04	Dr. Partab Puri
05	Dr. Shaikh Muhammad Akram
SENIOR LECTURERS/ LECTURERS/ DEMONSTRATORS	
06	Dr. Atta ur Rehman
07	Dr. Zain ul Hassan
08	Dr. Wisham Das
09	Dr. Khadim Lakhair
10	Dr. Aftab Memon
11	Dr. Palweesha
12	Dr. Danish Puri

VISION, MISSION, OUTCOMES AND SRMLG SYSTEM

The Medical Education department of ISUM & MMC has worked hard to achieve following goals:

- A. To develop a curriculum that fulfils the directions of PM&DC as well as LUMHS & ISU vision and mission simultaneously.
- B. To develop a plan and system to execute and monitor the curriculum that achieves the core competencies described by the WHO & PM&DC and yet take into account local dynamics, resources, limitation, strengths and weaknesses.

A. FULFILLING THE DIRECTIONS OF PM&DC AS WELL AS LUMHS & ISU VISION AND MISSION

One of the difficulties that any medical/dental college faces in the transition period while switching from one University to another, is aligning the vision and mission of the two universities with the program outcome & Bloom's taxonomy. As Muhammad Medical & Dental Colleges' programs are well aligned with the LUMHS' vision and mission, and in near future, they have to be aligned with the ISU's vision and mission, we expected that a fair amount of work will be needed. However, there are strikingly similarities in the contents and directions of the vision and mission of the two universities. These may be due to following facts

- Both are offering the same programmes of MBBS & BDS.
- Both are working in lines and directions given by the same regulatory bodies (PMDC).
- Both are working to produce a Global Five Star Doctor award, first described by Dr Charles Boelen, then of WHO, in 2000, and is judged on the following five criteria:
 1. **A CARE PROVIDER**, who considers the patient holistically as an individual and as an integral part of a family and the community, and provides high- quality, comprehensive, continuous, and personalized care within a long- term, trusting relationship.
 2. **A DECISION MAKER**, who makes scientifically sound judgments about investigations, treatments and use of technologies that take into account the person's wishes, ethical values, cost- effective considerations, and the best possible care for the patient.
 3. **A COMMUNICATOR**, who is able to promote healthy lifestyles by effective explanation and advocacy, thereby empowering individuals and groups to enhance and protect their health.
 4. **A COMMUNITY LEADER**, who, having won the trust of the people among whom he or she works, can reconcile individual and community health requirements, advise citizen groups, and initiate action on behalf of the community.
 5. **A MANAGER**, who can work harmoniously with individuals and organizations both within and outside the health system to meet the needs of individual patients and communities.

Pakistan Medical and Dental Council (PMDC) is the main governing and statutory body that ensures the ethical and standardized medical and dental teaching, learning, training and practice all over the country. One of the major achievements of this council is to establish 7 core competencies that a Pakistani doctor should achieve at the time of his/her graduation and named it as PMDC's seven-star doctor. These include all 7 attributes of a 5-star doctor and add it to include researcher and lifelong learner. These attributes are meant to warrant the standardization and uniformity among the medical graduates.

1. Care Provider.
2. Decision Maker.
3. Communicator.
4. Community Leader.
5. Manager.
6. Researcher.
7. Lifelong learner.

B. DEVELOPING A PLAN AND SYSTEM TO EXECUTE AND MONITOR THE CURRICULUM

Ibn e Sina University, Mirpurkhas (ISUM) is a newly formed University, which is the first university of Mirpurkhas Division. It follows a vertically integrated modular system. There are 37 modules divided in 5 years of MBBS Curriculum and 16 modules in four years of BDS program. Each year has an average of 40 weeks of studies. Weekly plan is organized as “theme”.

Regular classes, practical, clinics and hospital duties are amply supported by 5 pillars that contribute to the high standards of this first-ever university of Mirpurkhas division. These pillars include:

1. “Survive” a three-pronged system of weekly tests, assignments and post-test discussions.
2. “RLSE” or “Running Lives by Sharing Experiences”, a weekly mentoring program.
3. “MCS” or daily “Mobile Clinics by Students”.
4. “LBAS”, or “Learner Based Annual Symposia”.
5. “GSAT” Annual “Gastroenterology session with Students as Teachers”. Conducted by Prof. Dr. Syed Zafar Abbas.

Some people like to fondly remember these pillars by “Syed Razi Muhammad’s Learning Group” (SRMLG). After doing my fellowships and training in Surgery, I have spent the last 3 decades reading, studying and attending seminars, workshops and courses in medical education. This involves completing my courses of certificate, diploma and masters in medical education from the University of Dundee. Currently, I am engaged in doing PhD in Medical Education from University of Cyberjaya, Malaysia.

While we continue to learn and benefit from the research and innovation of others (no need to reinvent the wheel or rediscover the laws of motion), we must remember our own situations, culture and values and not neglect our strengths and weaknesses while developing our systems. This is exactly what we have done in developing our vision, mission and goals. If you go through them, you will appreciate that the above pillars are the powerful tools to achieve them. In a day and society, where copy & paste practices, plagiarism and recently letting the artificial intelligence replace the original and critical thinking, ISUM can take some pride in SRMLG. I am proud of my team to understand, participate and take forward this unique system which has raised the standard of learning, improved the results (Muhammad Medical College received the first prize in Sindh this year in innovation- by the Pakistan Association of private Medical & Dental Institutions or PAMI) and empowered the learners of ISUM.

1. “SURVIVE”, A THREE-PRONGED SYSTEM OF WEEKLY TESTS, ASSIGNMENTS AND POST-TEST DISCUSSIONS

University of Dundee uses Moodle which is a learning management system (LMS). At Dundee, all communications, announcements, submission of assignments and dissertation, their assessments and grading and academic chats between teachers and students takes place within Moodle. So in Survive too, Moodle is used for all 3 strategies (weekly tests, assignments and post-test discussions).

Survive is a time-tested tool that has been going on since March 2020. In different times, it has used the components of F2F, Hybrid and Online methods. It was started at the time of COVID and has continued since then in various forms. Each year is divided into 40 weeks and hence it has seen 215 weeks at the time of writing. Like any new thing, this idea of turning to massive online learning through “Survive” was also looked at with suspicion. There was resistance from some of the faculty members and students. They thought that online learning was probably some inferior sort of learning.

آئین نو سے ڈرنا، طرز کہن پہ اڑنا
منزل یہی کٹھن ہے، قوموں کی زندگی میں

I had to assert that the reality was quite the opposite. I presented the following studies to prove my point of view.

1. Brandon-Hall Study- This study showed that online learning saves 40-60% of learner's time than learning the same material in a F2F setting. The quality of learning is also improved by online learning.
2. The Research Institute of America- Online learning enhances the rate of retention by 25% to 60% while retention rates of F2F learning is only 8% to 10%. It may be due to the fact that an online learner can refer back to the learning material again and again at his/her convenience.
3. IBM has recently discovered that online learners learned almost five times more content during the same time as F2F learners.
4. Britain's Open University's study has discovered online courses consume 90% less energy and releases 85% less CO2 emissions per student than F2F learning. (Knowledge Direct Web).

At the beginning, during COVID Pandemic, we had no time to formally train our faculty or students. However, our WhatsApp groups and Facebook pages came handy and we (Me and Mr. Zubair) started writing posts and interacted with the faculty and students on daily basis (actually hourly basis), answering their queries, writing guidelines and recording short videos to illustrate our points and train our students and faculty.

In the initial days, I had to check assignments and make MCQs of many subjects. Slowly and gradually students started joining in. This was a very busy time. I trained two of my junior doctors (Dr. Saba and Dr. Hyder) and they proved a wonderful support. Still, I had to submit assignments of individual students (who emailed or Whatsapped them to me), guided them how to reduce the size of assignments and adopted techniques to avoid plagiarism. The dates of submission had to be extended many times. Few frustrated students got aggressive and had to be controlled with a carrot and stick approach. Some students wanted to avoid assignments as it consumed lots of time. However, I made it clear that:

- Assignments will continue in the current mode and will have to be submitted by everyone.
- We will discuss the problems and difficulties, but we will remain positive and boost each other's morale like a true family does. Students can share their frustration and depression by personally messaging me or a teacher. But on the general forum, only positive and morale boosting posts should be shared.

The schedule of assignments and tests on the portal will be strictly followed in spirit and order. No teacher, senior or junior will change anything (in fact only the Principal and the head of IT department have comprehensive administrative rights to edit anything on the portal). If some change is necessary, the teacher will discuss with the principal and that too much before the assignment is due, and then the Principal will make the necessary amendment.

- Only standard textbooks will be followed. Students should not follow the substandard books which largely discourage the concepts and promote rote learning. This goes much beyond destroying the understanding of a subject. It adversely affects one's mindset, thinking, character and personality too.
- Plagiarism will not be accepted. Copy and paste culture will be discouraged. Hence students must make assignments in their own handwriting and then make a pdf of the entire assignment and submit it in one piece. The size of the file may have to be reduced by using the proper software.
- Students & faculty have been strongly advised to get a good internet connection. They have been encouraged to discuss within the family and peers to improve their IT skills. No professional, including doctors, can progress in today's world without good IT skills.

Unfortunately, our educational system does not promote higher levels of cognition and affective domains. It merely promotes passive learning and rote memorization. As a result, most of the teachers and students rely on passive lectures and on substandard books which merely stress on remembering and recalling the facts until the examinations are over. Imagine how useless the information that the student memorizes with endless effort is, that:

1. Is easily accessible on google
2. Students are going to forget it soon anyway.

3. Is of no use in data interpretation and problem solving.

Our system is riddled with the old and outdated ideas. This can produce the followers and not the leaders. These results in producing the graduates who remember the long lists and facts but cannot think, inquire, create or lead. Examination system also favors people who are good in rote memorization. This has flooded the shops with substandard books from the poorly qualified people who have not mastered the subject but worked to find tricks to rote memorize the facts, so these facts can be spilled on the examination papers. Teachers enjoy the role of the sage who cannot be questioned and is the epitome of the entire system.

The world of education has gone through a paradigm shift with Benjamin Bloom (1956) publishing his work 64 years ago suggesting three domains of learning, i.e.: The cognitive domain (6 sub domain), the affective domain (5 sub domain) and the psychomotor domain (7 sub domain).

1. The cognitive domain (knowledge-based)

- a) Knowledge (Remember)
- b) Comprehension (Understand)
- c) Application (Apply)
- d) Analysis (Analyze)
- e) Synthesis (Create)
- f) Evaluation (Evaluate)

2. The affective domain (emotion-based)

- a) Receiving
- b) Responding
- c) Valuing
- d) Organizing
- e) Characterizing (Internalizing)

3. The psychomotor domain (action-based)

- a) Perception
- b) Set
- c) Guided response
- d) Mechanism
- e) Complex overt response
- f) Adaptation
- g) Origination

Our educational system still favors only knowledge and sometimes comprehension subdomains. Higher levels of cognition and affective domains are largely ignored and resisted.



Online Moodle Test Schedule for 2024

S. No	Days	Time	Year/Class
1	Monday	01:00pm to 02:00pm	Third Year BDS
2		02:30pm to 03:30pm	Final Year MBBS
3	Tuesday	10:00am to 11:00am	Third Year DPT
4		01:00am to 02:00PM	Fourth Year MBBS
5		02:30pm to 03:30pm	Final Year BDS
6	Wednesday	02:30pm to 03:30pm	Third Year MBBS
7	Thursday	10:00am to 11:00am	Second Year BDS
8		11:00am to 12:00pm	CHPE Morning Program
9		12:00am to 01:00am	Second Year DPT
10		02:30pm to 03:30pm	Second Year MBBS
11	Friday	11:30am to 12:30pm	First Year DPT
12		12:30pm to 01:30pm	First Year BDS
13		02:30pm to 03:30pm	First Year MBBS

IT DEPARTMENT

2. “RLSE” OR “RUNNING LIVES BY SHARING EXPERIENCES”, A WEEKLY MENTORING PROGRAM

Like weekly “Survive” and other tests, assignments including posttest Discussion (PTD) and attendance, some marks will be reserved for regular mentoring activities.

Meeting time will be reserved for one hour per week (Wednesday 1-2pm between mentees & mentors, Thursday 1-2pm between mentors and chief mentors).

Mentoring process is consist of:

1. Mentee
2. Mentor (5-10 mentee). Will submit a weekly report. If he fails to fill the B & C forms or report about the short coming of a mentee, he will be held responsible.
3. Class Coordinator (For a whole class). Will closely liaise with the mentors of his/her class and report to the Chief Mentor regularly. If a mentor is not performing his mentoring duties or not filling the form, and the Class Coordinator fails to report to the Chief Mentor, he will be held responsible.
4. Chief Mentor

5. Program Supervisor. Prof. Syed Razi Muhammad, assisted by Dr. Kiran Fatima and Mr. Mehmood-ul-Hassan will liaise with the mentors, class coordinators and the chief mentors and prepare reports. Mentor will have weekly meeting with 5-10 students every week at the mentoring hour (Wednesday 1-2pm). In a class of 100 about 12 and in a class of 50 about 8 mentors have assigned the role of mentor.

WHAT MAKES A GOOD MENTEE?

ROLE AND RESPONSIBILITY OF MENTEE:

1. Attend every session and get the mentoring forms B & C filled.
2. Listen intently to the suggestions and guidelines of the mentor, could note down too, but consider that time is of much value.
3. Speak clearly to the point, without confusion.
4. Have clear cut objectives before meeting with the mentor. Only then could the mentoring be effective.
5. Discuss and elaborate while chalking out strategies and plans. Stick to the ones arrived at.
6. Be transparent in both your talk and mind. Your mentor needs to know you better to guide you better.
7. Mentor has taken up the task to help and make you better in all aspects. Be not defensive. It becomes a barrier.
8. Showcase progress and be courteous of the effort that mentor is investing on you.
9. Positive or neutral comments on your mentor is expected to serve better the relation.
10. You cannot agree on everything with your mentor and hence express your opinions. This is beneficial for the both.
11. Seek knowledge and motivation to become better. Mentor has more to share and hence, ask for it. It is difficult to value if given free.
12. Schedule contact hours and weigh the benefits of active participation.
13. List and communicate strengths, learning needs, development potential, values and goals, both long and short term.
14. Inference on feedback of mentor on the mentee is essential for further course of action. Hence get coached better as well making most of the opportunity.

WHAT A MENTEE DOES	WHAT MENTEE DOES NOT DO
Regularly attend the classes, takes the weekly "SURVIVE" and other tests, completes assignments, attends meetings, ensures documentation and liaise with mentor, chief mentor and class coordinator.	Avoids taking the classes weekly "Survive" and other tests, completing assignments, attending meetings, ignores documentation and does not liaise with the mentor, chief mentor or class coordinator.
Take the initiative: recognize the need for mentoring and seek it out	Avoid difficulties: do not expect mentors to solve all your problems for you
Avoid perfectionism: accept that you will make mistakes, and learn from them	Sidestep work: do not expect mentors to do work that you should be doing yourselves
Work hard: are prepared to give your best	Stay in your comfort zone: do not shy away from new learning experiences
Support your peers: exchange personal and professional support with fellow trainees	Take advantage: do not use friendship with a mentor as a tool to avoid work or escape consequences of your own activities
Welcome experience: are enthusiastic about pursuing the widest range of professional experience	Bottle it up: do not avoid talking about problems, anxieties, or grief because it makes you seem less than perfect
Seek counselling: solicit advice or counselling if you experience problems with depression or burnout	Let your ego get in the way: recognize that everyone (faculty, residents, other trainees, nurses, and patients) has something to teach you
	Develop an anger issue or get stuck in conflicts

RESPONSIBILITIES OF CLASS COORDINATORS:

- ❖ Will ensure that the attendance and results of boys are posted in boys' group and parents of boys' group, similarly attendance and results of girls are posted in girls' group and parents of girls' group.
- ❖ Please ensure that parents of poor performers are called for meeting with the senior faculty member.
- ❖ I think class coordinators should also be in mentors' groups of their class (A1, 2, 3, B1, 2, 3, C1,2,3 and D1,2,3).
- ❖ This will help students to liaise with the class activities.
- ❖ Coordinators should help in completing the parents' groups, adding the contacts of parents and ensuring that only the admins should be able to post in the groups.
- ❖ They must also share the attendance and results of weekly survive and any other tests in students' and parents' groups.
- ❖ They also need to coordinate with the HoDs, Chief Mentors and Principals

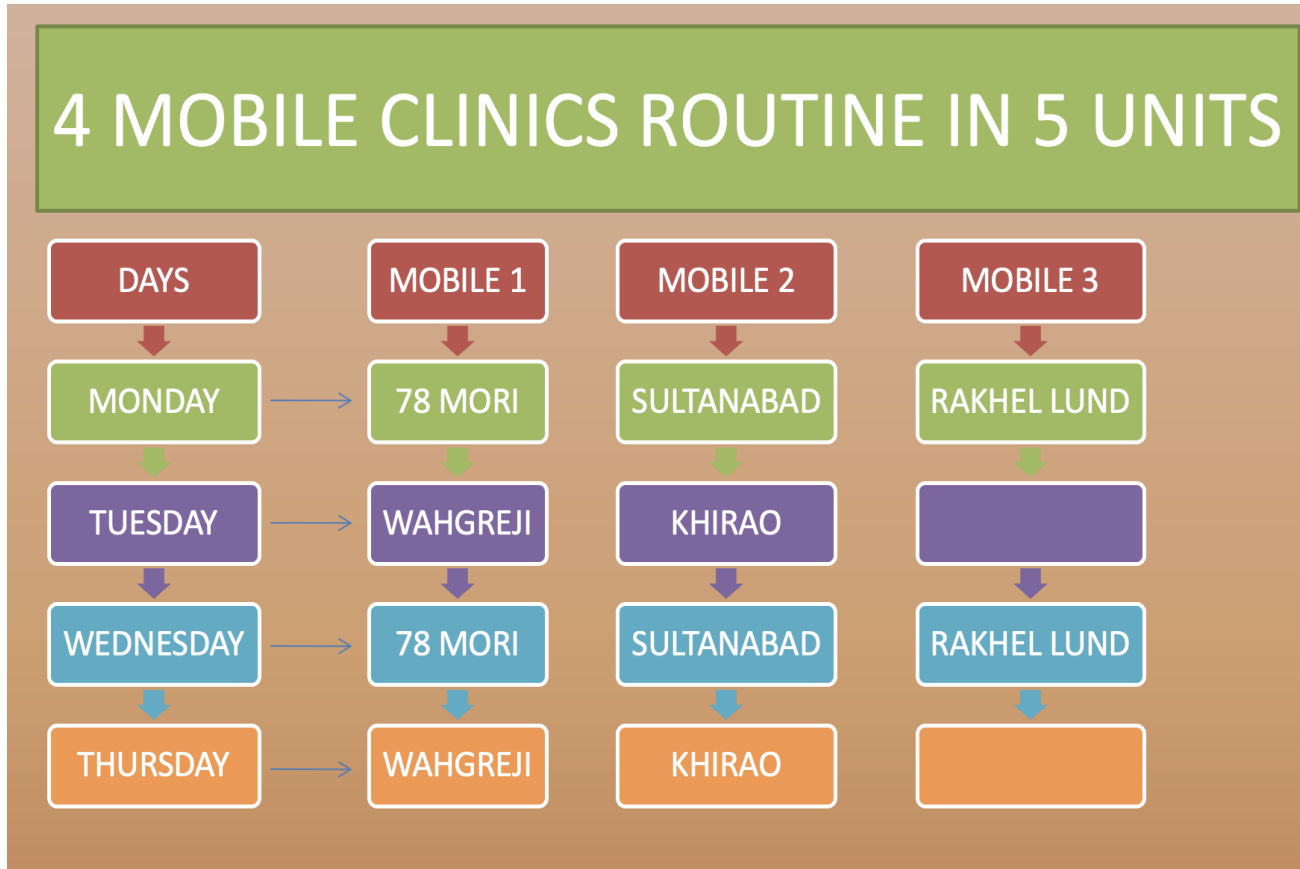
FIRST PROFESSIONAL MENTORING GROUPS

CLASS COORDINATOR: DR. SAQUIB BALOCH

Mentor	Meeting venue	Mentee1 (G.L)	Mentee 2	Mentee 3	Mentee 4	Mentee 5	Mentee 6	Mentee 7	Mentee 8	Mentee 9	Mentee 10	Mentee 11
Dr Nazma	First yr Lec Hall	Aamna (01)	Ajwa Wazir (02)	Ajwa Javed (03)	Aleena Rehman (04)	Alisha Javed (05)	Alsihba Raees (06)	Aliza Barkat Ali (07)	Amisha (08)	Anita (09)	Asma (10)	
Dr Zartasha	First yr Lec Hall	Ayat (11)	Ayesha Habibullah (12)	Ayesha Yaqoob (13)	Bhawna Bai (14)	Bisma Waseem (15)	Bisma Fatima (16)	Bushra Maryam (17)	Dua (18)	Dua Iqtadar (19)	Emaan (20)	
Dr Maria	First yr Lec Hall	Faiza Bibi (21)	Farwa (22)	Faryal (23)	Isha Fatima (24)	Kanwal (25)	Kashish Ramesh (26)	Kashish Din Muhammad (27)	Kasmala (28)	Laiba (29)	Laiba Malik (30)	
Dr Manahil	First yr Lec Hall	Mafaza Khan (31)	Mahnoor (32)	Manaim Zainab-33	Masooma Fatima (34)	Mehreen (35)	Mehwish (36)	Muskan Rani (37)	Nandni (38)	Rabia (39)	Razia (40)	
Dr Sania	First yr Lec Hall	Ribah Ahmed (41)	Rida Khalid (42)	Rida Fatima Sufyan-43	Rida Fatima Ashraf (44)	Rubai (45)	Samiya (46)	Savera Khan (47)	Sehar Un Nisa (48)	Shaista (49)	Shazia (50)	Alisha (88)
Dr Huma	Anatomy Dept	Shumaila (51)	Soha Naz Shuhaiber (52)	Surhan Aziz (53)	Tamanna Khurshaid (54)	Tasawal Fatima (55)	Umaima (56)	Ume Rubbab (57)	Zaib un Nisa (58)	Zainab (59)	Zehra (60)	Zonia (61)
Dr Asadullah Palli	Anatomy Dept	Aadil Roshan (62)	Abdul Ahad (63)	Abdullah M.Arshad (64)	Abdullah Farooq (65)	Abdur Rehman (66)	Ahad (67)	Ali Naaz (68)	Aoun Raza (69)	Araiz (70)	Asif Ahmed (71)	
Prof Dr Habib Chohan		Asmatullah (72)	Daniyal (73)	Farhan (74)	Faseeh ur Rehman (75)	Gul Muhammad (76)	Hassan Ali (77)	Mahtab Rai (78)	Maqbool Ahmed (79)	Muhammad Jaffar (80)	Mubashir (81)	
Dr Shoukat Ahwan	Anatomy Dept	Mubeen Irshad (82)	Mudasir Bilawal (83)	Muhammad Fahad (84)	Muhammad Hussain (85)	Muhammad Huzafa (86)	Muhammad Imran (87)	Muhammad Samnder (89)	Muhammad Talha (90)	M. Zaheer u Din Babar (91)	Naeemullah (92)	
Dr Saqib Baloch	Anatomy Dept	Pir Shahzeb Akbar 93	Saad (94)	Saad Hussain (95)	Shakeel Ahmed (96)	Syed Zainul Abiden Shah (97)	Talha Bin Abdullah (98)	Waqas Ahmed (99)	Zohak Khan (100)			

3. MOBILE CLINICS BY THE STUDENTS (MCS)

“MCS” or daily “Mobile Clinics by Students” is a part of the unique 5 pillars system which support the vertically integrated modular system of Ibne Sina University, Mirpurkhas (ISUM). This was started in 2018 in collaboration with APPNA, when then President of APPNA supplied 4 mobile health systems to MMC/ISUM to run this unique system.



Now, apart from the students of MBBS, students of BDS and DPT have also joined the mobile clinics by the students (MCS).

Following is the report of each year of MCS.

4. LEARNER BASED ANNUAL SYMPOSIUM (LBAS) 26TH SYMPOSIUM

Rigorous reverberation on scientific symposium started from October 1 to 11, 2024 encompassing pre-symposium workshops, research papers from faculty, students and invited speakers from Karachi, Hyderabad, Nawabshah, Sukkur, Gambat & other cities of interior Sindh. Muhammad Medical College, Mirpurkhas, Sindh, successfully organized pre-symposium workshops, a symposium, and a conference on themed as

5. "GSAT" ANNUAL "GASTROENTEROLOGY SESSION WITH STUDENTS AS TEACHERS"

Muhammad Medical College (MMC), a constituent college of Ibn-e-Sina University, Mirpurkhas (ISUM), has become an icon in the field of medical education and healthcare services in Pakistan. Not only it provides quality formal medical education, but as part of its innovative activities, it keeps holding several nontraditional activities to stimulate and provoke scientific curiosity among its students and teachers throughout the year. It therefore came as no surprise that under the leadership of its Chancellor Professor Syed Razi Muhammad, ISU received the prestigious National Healthcare Excellence Award 2025 recently at Lahore from Federal Minister of Health early April this year.

As part of these activities, for which ISUM is now well known throughout its history on National level and in particular throughout the existence of MMC since its inception in 1998, it held its 15th Annual Mirpurkhas Seminar in Medical Sciences on 30th April 2025. It is its mission to provide excellent medical educational activities to the medical students and doctors belonging to it in particular but to all doctors in the city of Mirpurkhas via open invitation, completely free of cost. The seminar was attended by Final year students along with junior and senior doctors of all clinical departments. ISU strongly believes that participating in such seminars plays an essential role in the intellectual growth of future doctors, seeing high quality advanced talks coming from experts in a variety of medical specialties.

POLICY FOR ELECTIVES

Electives are not mandatory nor are they a part of the curriculum. Electives are considered add on extra-curricular activities with benefits for selection for jobs or postgraduate training after BDS.

- a. The Electives Rotation will be of four weeks' duration.
- b. It will be planned at least six months in advance during the 3rd or 4th Year.
- c. The Elective will be planned during the **SUMMER HOLIDAYS** preferably.
- d. The institution or department will be of the student's choice.
- e. During the elective, the student will not get credit for attending lectures at MDC.
- f. **It is the student's responsibility to ensure that his/her overall attendance record is not affected adversely by the elective.**
- g. The student will not proceed on an elective without informing the Principal or Concerned chairperson designated for this purpose who will take permission from the Principal.
- h. The student will sign a waiver to the effect that any shortfall in attendance is his /her own responsibility and will be dealt with as per rules of Liaquat University of Medical & Health Sciences (LUMHS).
- i. The adequacy of education during the elective is the student's own responsibility.
- j. Permission to attend an elective is given by the Associate Dean designated for this purpose. This simply implies that the college authorities are aware that the student is away for this period so that admission is not cancelled.
- k. The student will ensure that the Elective Supervisor completes an evaluation report at the end of the elective.
- l. MDC will not provide any financial assistance for the elective.

ATTENDANCE POLICY FOR STUDENTS

As per PMDC rules for eligibility in annual examinations.

- Minimum attendance requirement is 75% in each subject: attendance is for lectures, demos, practicals, clinics, PBLs, SURVIVE, CPC, presentations, etc, indoor and outdoor.
- The attendance is not simply for lectures.

Attendance is maintained by the Department of Student Affairs at MMC-ISUM.

LEARNING STRATEGIES

The following instructional and learning strategies are implemented to foster greater comprehension:

- ❖ Interactive Lectures
- ❖ Small group sessions
- ❖ Case-Based Learning (CBL),
- ❖ Self-Study,
- ❖ Practical,
- ❖ Skills lab sessions,
- ❖ Demonstrations
- ❖ Field visits

INTERACTIVE LECTURES

In large group, the lecturer actively involves the students by introducing the topic or common clinical conditions and explains the underlying phenomena by questions, pictures, videos of patients' interviews, exercises, etc. in order to enhance their learning process.

SMALL GROUP TEACHING (SGT):

This strategy is helpful for the students to make their concepts clear, and s acquiring skills or attitudes. These sessions are organized with the help of specific tasks such as patient case, interviews or discussion topics. Students are than encouraged to exchange their ideas and apply knowledge gained from lectures, tutorials and self-study. The facilitator employs probing questioning, summarization, or rephrasing techniques to enhance the understanding of concepts.

CASE- BASED LEARNING:

A format of small group discussion that centers on a sequence of questions derived from a clinical scenario, with the aim of facilitating learning. Students engage in discussions and provide answers by applying pertinent knowledge acquired in clinical and basic health sciences throughout the curriculum.

PRACTICAL:

Basic science practical related to anatomy, biochemistry, pathology, pharmacology and physiology are scheduled to promote student learning by application.

SKILLS LAB SESSION:

Skills relevant to respective module are observed and practiced where applicable in skills laboratory.

SELF DIRECTED LEARNING:

Students take on the responsibility of their own learning by engaging in independent study, collaborating and talking with classmates, accessing knowledge from the Learning Resources available, teachers, and other experts. Students can make use of the designated self-study hours provided by the college.

DEMONSTRATIONS:

During Anatomy teaching hour, students in small groups are encouraged to utilize their knowledge in demonstrating different morphological features of various organs of the body with the help of their facilitator and discuss with their peers. This would help in enhancing their learning as well as motivate them in team based learning environment.

FIELD VISITS:

Students visit community health areas to understand the common diseases and their preventive measures.

**MODULES, THEMES, CONTACT HOURS, CREDIT HOURS
OF FIRST YEAR OF MBBS PROGRAM-2025**

THEME NAME	DURATIO N	CONTAC T HOURS	CREDIT HOURS			
LFIRST YEAR MBBS						
Total 28 Themes		40 weeks	1300	81.25		
Introductory Week	1 week	32.5	2.03			
Cell Structure, Chemistry and Functions	1 week	32.5	2.03			
Cellular Interactions, Cell Injuries, Cellular Response and Adaptation	1 week	32.5	2.03			
Body Fluids: Composition, Function, Homeostasis	1 week	32.5	2.03			
Macromolecules Fundamental Tissue/System of the Human Body	1 week	32.5	2.03			
Fundamental Tissue/System of the Human Body	1 week	32.5	2.03			
Development, Differentiation and Growth	1 week	32.5	2.03			
Genetics and Developmental Anomalies	1 week	32.5	2.03			
Assessment	1 week	32.5	2.03			
Total Contact Hours for 9 Weeks			9-Weeks	292 Hours	18.28 Credit Hours	
Red Cell Disorders (Anemia, Polycythemia)	2 weeks	32.5*2= 65 Hours	4.06			
Infections and Inflammation	1 week	32.5	2.03			
Bleeding and Thromboembolic Disorders	1 week	32.5	2.03			
ABO and Rh-Incompatibility	2 weeks	32.5*2= 65 Hours	4.06			
Immunological Disorders	1 weeks	32.5	2.03			
Assessment	1 week	32.5	2.03			
Total Contact Hours for 8-Weeks			8-Weeks	260 Hours	16.25 Credit Hours	
Pectoral Region And Breast	1 week	32.5	2.03			
Back, Axilla And Shoulder Joint	1 week	32.5	2.03			
Brachial Plexus And Arm	2 weeks	32.5*2= 65 Hours	4.06			

		65 Hours			
Forearm, Hand, Carpal Tunnel Syndrome	1 week	32.5	2.03		
Anterior Thigh and Femoral Hernia	1 week	32.5	2.03		
Gluteal Region, Hip Joint and Sciatic Nerve	2 weeks	32.5*2= 65 Hours	4.06		
Anterior Compartment of Leg and Compartment Syndrome	1 week	32.5	2.03		
Posterior Compartment of Leg and Foot	1 week	32.5	2.03		
Assessment	1 week	32.5	2.03		
Total Contact Hours for 11-Weeks			11-Weeks	357 Hours	22.34 Credit Hours
Arrhythmias and Myocardial Infarction	1 week	32.5	2.03		
Congenital Anomalies of Cardiovascular System	1 week	32.5	2.03		
Hypertension	2 weeks	32.5*2= 65 Hours	4.06		
Heart Failure	1 week	32.5	2.03		
Assessment	1 week	32.5	2.03		
Total Contact Hours for 06-Weeks			06-Weeks	195 Hours	12.18 Credit Hours
The Chest/Thoracic Wall And Trauma	1 week	32.5	2.03		
Airways And Their Conditions Or Disease	2 weeks	32.5*2= 65 Hours	4.06		
Lung Parenchyma and Interstitium and their Conditions or Diseases	2 weeks	32.5*2= 65 Hours	4.06		
Assessment	1 week	32.5	2.03		
Total Contact Hours for 06-Weeks			06-Weeks	195 Hours	12.18 Credit Hours

FIRST YEAR MBBS
LIST OF WORKSHOPS AND COMPETENCIES ACCORDING TO MODULES
MUHAMMAD MEDICAL COLLEGE-MIRPURKHAS-ISUM

Competence-based medical education is being promoted by the World Federation of Medical Education and PM&DC. In its quest to be a national/international leader in producing quality doctors, Muhammad Medical College, Inbe-Sina University has developed a state-of-the-art Skills Lab/ Simulation Centre and a unique Program of teaching and training the 64 Clinical skills required by a doctor. Each skill will be taught at the skill/ simulation lab and will be strengthened in the wards. Following is the schedule of the program. Each session may be preceded by a brief introduction/video. A printed as well as the electronic logbook will be maintained for/ by each student. This record will be automatically updated and kept in the student's e-file, and some marks will be awarded in each modular/ annual examination to the student. Here, the skills have been divided according to

MODULE NAME	COMPETENCIES	LUMHS LEARNING OBJECTIVES	NAME OF WORKSHOP	VENUE
MOD-I Foundation module	Demonstrate the use of the Microscope	Describe the basic laboratory techniques and demonstrate the use of a microscope to identify basic laboratory skills	Microscope handling	Physiology Lab
	Demonstrate hand washing technique	Demonstrate hand washing technique	Hand Washing	Physiology Lab
	Demonstrate the use of Microscope	Techniques of using glassware and handling Biochemical instruments during laboratory work.	Handling of Biochemical instruments	Biochemistry Lab
	Power Lab handling	Introduction to Power Lab	Handling of Power lab	Physiology Lab
	Biochemical analysis of carbohydrates	Perform Biochemical analysis of carbohydrates	Biochemical analysis of carbohydrates	Biochemistry Lab
	Preparation of different solutions	Prepare different solutions used in laboratory for tests	Preparation of different solutions	Biochemistry Lab
	Sterilization Protocol	Basics of sterile techniques and disinfection.	Sterilization Protocol	Skills Lab/Surgical

MOD-2 Hematology-I	Perform blood sampling	Collect blood sample by various methods i.e. pricking method & venipuncture on dummies	Methods of blood sampling	Physiology Lab
	Prepare Peripheral Blood film	Prepare blood film & Identify and quantify different types of white blood cells on blood film	Peripheral Blood film	Physiology Lab
	Blood grouping	Identify different blood groups	Blood grouping	Physiology Lab
	Sahli's method for Hb determination	Determine hemoglobin concentration (Sahli's method)	Sahli's method for Hb determination	Physiology Lab
	Interpretation of Normal and abnormal Hb	Laboratory diagnosis of Anemia	Interpretation of Normal and abnormal Hb	Physiology Lab
	Bleeding and clotting time	Estimate bleeding time, clotting time (BT & CT)	Bleeding and clotting time	Physiology Lab
	Diagnosis of Bleeding Disorders	Laboratory diagnosis of Bleeding Disorders	Diagnosis of Bleeding Disorders	Physiology Lab
	Estimation of ESR	Estimate erythrocyte sedimentation rate (ESR by Westergreen method)	ESR Estimation	Physiology Lab
	History taking Skills	<p>Practice history taking: patients with anemia and bleeding disorders on simulated lab</p> <ul style="list-style-type: none"> • Understand patients' stance while taking a comprehensive history or in any other scenario like breaking bad news, conflict resolution, disaster management, information care, etc. • Communicate well his/her own understanding and strategy in interpersonal relationships. • Use cognitive and behavioral theories while communicating with others and in any clinical or non-clinical activity. • Believe in the implication of socio-cultural factors such as gender, race, social class, family, and occupations in health and disease. • Be able to correlate the psychosocial aspects with the 	History taking Skills, Communication Skills, Breaking bad news Conflict resolution	Skills Lab

		<p>common clinical conditions (DM, Coronary Artery Disease, AIDS, etc.)</p> <ul style="list-style-type: none"> • Identify the social and anthropological factors that influence detection, management, compliance, and clinical outcome (stigma, myths, cultural taboo, somatization, etc.) • Demonstrate stress management skills towards self, patients, and colleagues. <ul style="list-style-type: none"> • Be highly concerned about the psychosocial factors in important clinical settings like hospitalization, emergency, ICU, cancer wards, etc. <p>Early Clinical Exposure (ECE): observe patient examination and basic surgical procedures</p>		
	Orientation to the operating theatre (OT)	<ul style="list-style-type: none"> • Orientation to the operating theatre (OT) and surgical instruments (introductory). 	Orientation to the operation theatre (OT)	Skills Lab/OT Complex
MOD-3 MSK-I	The muscular twitch response	To develop skills in recording, analyzing, and interpreting phases of muscular twitch response experimentally.	Muscular twitch response	Histology Lab
	EMG	Perform EMG	Electromyogram	Physiology Lab
	Interpretation of Calcium and Phosphorus	To acquire skills in interpreting calcium and phosphorus levels for assessing bone and metabolic disorders	Interpretation of Calcium and Phosphorus	Physiology Lab
	Action potential	To develop skills in recording, analyzing, and interpreting neuronal action potentials for understanding excitable cell physiology.	Action potential	Physiology Lab
	Muscle Fatigue	To develop skills in inducing, recording, and interpreting muscle fatigue for understanding neuromuscular physiology mechanisms.	Muscle Fatigue	Physiology Lab
	Breast Examination	Perform Breast examination	Breast Examination	Skills Lab

MOD-4 CVS-I	Identification of cardiac tissues and blood vessels	Identification of cardiac tissues and blood vessels under the microscope with points of Identification.	Identification of cardiac tissues and blood vessels	Histology lab
	Measuring blood pressure	To measure blood pressure using a Sphygmomanometer with correct technique and interpretation of its values and calculation of mean arterial pressure Recording of arterial blood pressure. Effects of exercise and posture on blood pressure	Measuring blood pressure	Physiology Lab
	Examination of pericardium	Examination of heart sound Apex beat and normal heart sounds.	Examination of pericardium	Physiology Lab
	Examination of heart sounds, Apex beat and normal heart sounds	Identification of areas on the chest for auscultation of the heart sounds.	Examination of heart	Skills Lab
	ECG	Placing electrodes and obtaining an electrocardiogram and interpretation of the basic ECG findings. ECG recording and interpretation of normal ECG Pulse rate, blood pressure, ECG recording on power lab and ECG machine	ECG	Physiology Lab
	Examination of arterial pulses	Examination of arterial pulses	Examination of arterial pulses	Skills Lab
MOD-5 Respiratory-I	Cardiopulmonary Resuscitation (CPR)	Perform CPR on Mannequins	Cardiopulmonary Resuscitation (CPR)	Skills Lab
	Triple response	Demonstrate and explain the mechanism of Lewis's Triple Response (red reaction, flare, and wheal) and correlate it with underlying physiological processes involving local vascular and neural mechanisms.	Triple response	Physiology Lab
	Microscopic identification of the respiratory system	Microscopic identification of the different parts of the respiratory system.		Histology Lab
	Interpretation of ABGs, PFT	Interpretation of ABGs, PFT	Interpretation of ABGs, PFT	Biochemistry Lab

	Application of a pH meter	Application of pH meter	Application of pH meter	Biochemistry Lab
	Clinical examination of the respiratory system	Perform a clinical examination of the respiratory system		Skills Lab, Hospital rotation
	Pulmonary volumes, capacities and their clinical interpretation.	Perform the spirometry & plot a graph of lung volume Recording of respiratory movements using a stethoscope Respiratory adaptations during standing, sitting, and swallowing		Physiology Lab Skills Lab, Hospital rotation

PURPOSE OF STUDY GUIDE

A study guide is a strategic and effective approach to

- ❖ Provide students a detailed framework of the modules organization
 - ❖ Support students in organizing and managing their studies throughout academic year.
 - ❖ Provide students information on assessment methods and the rules and regulations that apply.
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- It outlines the outcomes which are expected to be achieved at the end of each module.
 - Ascertain the education strategies such as lectures, small group teachings, demonstration, tutorial and case based learning that will be implemented to achieve the module objectives.
 - Provides a list of learning resources for students in order to increase their learning.
 - Emphasizes information on the contribution of attendance, end module tests, block examinations and annual examinations on the student's overall performance.
 - Includes information on the assessment methods that will be held to determine every student's achievement of objectives.

FOUNDATION MODULE-1

Introduction Welcome to the foundation module. This exciting module will serve as building block and is very essential to your future work as doctors. This module is designed to make your learning both interesting and productive by including several interactive activities.

During this module, students will be encouraged to learn basic organization of human body in terms of structure, function and Biochemical properties in an integrated manner i.e. Basic subjects including Anatomy, Physiology, Biochemistry, Pharmacology and Pathology will be learned and assessed together. You will also learn to integrate basic knowledge with clinical relevance. By adopting this approach, you will be prepared for your future work as doctor, where patients will come to you with problems that are not categorized by discipline name.

In order to help you learn in an integrated manner, we have updated the learning of basic sciences around a few key health-related situations (real life situations), which you are likely to encounter as house officers. You will be expected to think about the scenarios and participate in case-based learning sessions for clearing your concepts and better learning. It will also help you focus your attention on what you need to achieve from the Interactive Lectures, practical and tutorials that have been scheduled during this module.

Rational Orientation of medical sciences in respect to health and disease is the fundamental requirement of every medical student. Therefore, this module is designed to provide the integration of core concepts that underlie the foundation of basic sciences and their correlation and application in clinical sciences. Students also learn clinical skills such as how to communicate effectively with patients and their relatives with compassion and understanding their issues/problems and how to resolve in coming years. Working in groups will enhance students' team working skills and capacity and management skills. Along with LGT/Interactive Lectures, practical and demonstrations; through supplemented case-based learning they develop problem solving skills to apply their basic medical knowledge and skills to practical situations under supervision and subsequently in real life practice.

Duration 8 weeks

Learning Outcomes

by the end of this foundation module, the students should be able to: Knowledge

- Describe the cell division, its types and genetic material along with its clinical correlation.
- Describe the basic organization of the human body.
- Describe the basic tissues of the human body
- Explain the maintenance of homeostatic mechanism.
- Describe the various malformations.
- Describe the Biochemistry of carbohydrates, nucleic acids and enzymes
- Describe various cellular adaptations during cell growth, differentiation and cell injury
- Describe the basic concepts of medical ethics, professionalism, clinical research, behavioral sciences, communication skills, information technology skills

Skills

- Describe the basic laboratory techniques and demonstrate the use of microscope
- Identify basic tissues under the microscope
- Learn and follow the basic laboratory protocols
- Perform Biochemical analysis of carbohydrates
- Prepare different solutions used in laboratory for tests

Attitude

- Follow the basic laboratory protocols
- Participate in class and practical work professionally
- Communicate effectively in a team with peers, staff and teachers
- Demonstrate professionalism and ethical values in dealing with patients, cadavers, peers, staff and teachers.
- Communicate effectively in a team with peers and teachers.
- Demonstrate the ability to reflect on the performance.

Themes

Theme 1: Cell structure, Chemistry and Function

Theme 2: Cellular interactions, Cell injuries, Cellular responses and Adaptations Theme 3: Body fluids: Composition, Function & Homeostasis

Theme 4: Macromolecules: Fundamental tissues/systems of the human body Theme 5: Fundamental tissues/systems of the human body

Theme 6: Development, Differentiation and Growth Theme 7: Genetics and Developmental anomalies

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES				
INTRODUCTORY WEEK				
S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
1	State the history of the subject Anatomy, including its various branches and practical applications of Anatomy as a foundation in different fields of medicine	Fnd-S1-Ana-G1 Introduction to the subject of Anatomy and its subdivisions	Interactive Lecture	SBQs & OSVE
2	Comprehend the exact location of dissected/ prosecuted part /organ of human body with respect to various terms of positions, direction, and body planes	Fnd-S1-Ana-G2 Anatomical position, Anatomical planes & terms of position		
3	Interpret the movements of different parts of the human body the knowledge of various terms of movement.	Fnd-S1-Ana-G3 Terms of movements		
4	Explain the appendicular and axial skeleton	Fnd-S1-Ana-G4 Introduction to the parts of axial and appendicular skeleton		
Physiology				
5	Define Physiology and Enumerate the branches of Physiology	Fnd-S1-Phy-1 Introduction to Physiology	Interactive Lecture	SBQs & OSVE
Biochemistry				
6	Define Biochemistry & Discuss the role of Biochemistry in medicine	Fnd-S1-Bio-1 Introduction to Biochemistry and its	Interactive Lecture	SBQs

		implication in medicine		&OSV E
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7	Describe the significance of Protection protocols to keep yourself safe during Biochemistry laboratory work.	Fnd-S1-Bio-2 Laboratory Hazards & Protection Protocols	Practical	OSPE & OSVE
8	Demonstrate the importance of chemicals and reagents in the different reactions of Biomolecules	Fnd-S1-Bio-3 Chemicals and reagents		
9	Illustrate techniques of using glassware and handling of Biochemical instruments during laboratory work.	Fnd-S1-Bio-4 Use of glassware & Instruments for laboratory work		
Pathology				
10	Define the pathology Enumerate the different branches of pathology Describe the terminologies used in Pathology	Fnd-S1-Path-1 Introduction to Pathology	Interactive Lecture	SBQs & OSVE
Pharmacology				
11	Define the Pharmacology and role of Pharmacology in medicine Discuss Pharmacodynamics and Pharmacokinetics	Fnd-S1-Pharm-1 Introduction to Pharmacology	Interactive Lecture	SBQs & OSVE
Community Medicine				
12	Define different definitions of public health/Community Medicine Discuss basic functions of Publichealth/community Medicine Define the difference between clinical and community medicine Discuss Non-Governmental organizations, international agencies and National Programs of Pakistan.	Fnd-S1-CM-1 Introduction to Community Medicine & Public Health	Interactive Lecture	SBQs & OSVE
Forensic Medicine				
13	Define Forensic Medicine, Forensic Pathology and state Medicine Know the branches and the history of Forensic Medicine briefly Discuss the scope of Forensic Medicine in practice Identify the essential facilities for medico legal investigation. Define medical jurisprudence and differentiate it from Forensic medicine	Fnd-S1-FM-1 Introduction to Forensic Medicine and Toxicology	Interactive Lecture	SBQs & OSVE

Medical Education				
14	Describe the curriculum and modules under implementation Describe the use of study guides (not to be assessed) Differentiate between various teaching & learning strategies Enlist various assessment tools, and assessment policy	Fnd-S1-ME-1 Curriculum structure, teaching learning strategies	Interactive Lecture	SBQs & OSVE
15	Describe various study skills strategies	Fnd-S1-ME-2 Study skills strategies		
Information Technology				
16	Define IT and its importance in Medicine	Fnd-S1-IT-1 Importance of IT skills	Interactive Lecture	SBQs & OSVE
Library Sciences				
17	Learn literature search skills	Fnd-S1-LIB-1 Literature search and library resources	Interactive Lecture	SBQs & OSVE
Behavioral Sciences				
18	Learn the significance of communication skills in Medical Sciences	Fnd-S1-BS-1 Introduction to Behavioral Sciences	Interactive Lecture	SBQs & OSVE
Communication Skills				
19	Learn the significance of communication skills in Medical Sciences	Fnd-S1-CS-1 Introduction to communication skills	Interactive Lecture	SBQs & OSVE
Biomedical Ethics				
20	Learn the significance of ethics in Medical Sciences	Fnd-S1-BE-1 Introduction to Bio-Medical Ethics	Interactive Lecture	SBQs & OSVE
Research Methodology				
21	Learn the significance of ethics in Medical Sciences	Fnd-S1-RM-1 Introduction to research methodology	Interactive Lecture	SBQs & OSVE

Theme 1: Cell Structure, Chemistry & Functions

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				

22	Describe the basic structure and functions of cell membrane. Describe the basic structure and functions of the Nucleus.	Fnd-S1-Ana-H1 Cell structure and function (Membrane structure and the Nucleus)	Interactive Lecture	SBQs & OSVE
23	Describe the structural Organization of different organelles of a cell. (Endoplasmic Reticulum, Golgi Apparatus, Ribosomes, Centrioles, Mitochondria, Lysosomes, Peroxisomes)	Fnd-S1-Ana-H2 Cell Organelles		
24	Operate the different parts of the light microscope. Explain how to use the light microscope to visualize a slide.	Fnd-S1-Ana-H3 Parts of the Light microscope	Practical	OSPE & OSVE
Physiology				
25	Describe the Functional arrangement of different levels of organization and the General structure, Physiology, and composition of cell, tissues, organs, organ systems, cell nutrition, capillaries, and venules.	Fnd-S1-Phy-2 Functional arrangement of different levels of organization and the General structure and composition of the Cell.	Interactive Lecture	SBQs & OSVE
26	Define the Functional organization of different components of a cell and its organelles. Describe the functions of lysosomes & peroxisomes, Endoplasmic Reticulum.	Fnd-S1-Phy-3 Cell organelles-I (Lysosomes, Peroxisomes, Endoplasmic Reticulum, Golgi complex)		
27	Describe the functions of mitochondria, their special features & their role in the generation of ATP Describe the functions of the ER, Golgi apparatus, and the Ribosomes and cytoskeleton.	Fnd-S1-Phy-4 Cell organelles-II Mitochondria, Microtubules & Microfilaments, Ribosomes, Vaults, Centromere.		
28	Recognize the structure & Functions of the Nucleus	Fnd-S1-Phy-5 Nucleus & its functions		
29	Show the Parts and Functions of the Microscope	Fnd-S1-Phy-6 Introduction to Microscope	Practical	OSPE & OSVE
Biochemistry				
30	Describe the chemical structure and significance of mitochondria, functions and location of enzymes for metabolic pathways & chemical reactions that occur in mitochondria.	Fnd-S1-Bio-5 Mitochondria: Structure, functions & location of enzymes for metabolic pathways	Interactive Lecture	SBQs & OSVE

31	Prepare all types of solutions and their quantities for different chemical reactions.	Fnd-S1-Bio-6 Solutions, concentration expression (Percent solutions, Molarity, Molality, Normality)	Practical	OSPE & OSVE
Pathology				
32	Define Hypertrophy, Hyperplasia, Atrophy and Metaplasia. Enlist the Physiological and pathological mechanisms of cellular adaptation	Fnd-S1-Path-2 Cellular adaptations	Interactive Lecture	SBQs & OSVE

Theme 2: Cellular Interactions, Cell Injuries, Cellular Responses, and Adaptations

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
33	Describe the components of cell surface modifications and the junction complex	Fnd-S1-Ana-H-4 Cell surface modifications and cell Junctions	Interactive Lecture	SBQs & OSVE
34	Differentiate between normal and abnormal cell division and their consequences	Fnd-S1-Ana-E-1 Cell cycle: Mitosis and Meiosis cell divisions		
35	Enlist steps of tissue processing. Define the artifacts. Know the basic histological stains. Define H&E Staining.	Fnd-S1-Ana-H-5 Slide preparation and the H&E Staining	Practical	OSPE & OSVE
Physiology				
36	Explain the composition and basic structure of the cell membrane, its functional importance, and adaptation	Fnd-S1-Phy-7 Plasma membrane & its structure and function	Interactive Lecture	SBQs & OSVE
37	Describe the types and processes of transport across the membrane and their effects.	Fnd-S1-Phy-8 Types of transport, Simple Diffusion		
38	Describe the Transport across the cell membrane via a mediated method. Describe the process of osmosis	Fnd-S1-Phy-9 Protein-mediated transport: Facilitated diffusion Osmosis		
39	Explain the Physiological mechanism and types of transport. (Passive & Active)	Fnd-S1-Phy-10 Active transport, Primary active transport, Secondary active transport Bulk transport		

40	Describe the membrane potential its development & maintenance of resting membrane potential. Explain Permeability of cell membrane Explain the Propagation of action potential and its ionic basis	Fnd-S1-Phy-11 Resting membrane Potential Graded potential, Factors affecting membrane potential		
41	Discuss action potential Give mechanism of propagation of action potential & its ionic changes	Fnd-S1-Phy-12 Action potential		
42	Employ types and methods of sterilization	Fnd-S1-Phy-13 Sterilization	Practical	OSPE & OSVE
Pathology				
43	Demonstrate gross and microscopic features of cellular adaptations and Necrosis	Fnd-S1-Path-3 Cell Pathology	Interactive Lecture	SBQs & OSVE
Pharmacology				
44		Fnd-S1-Pharm-2 Introduction to Pharmacokinetics	Interactive Lecture	SBQs & OSVE
45		Fnd-S1-Pharm-3 Introduction to Pharmacodynamics		

Theme 3: Body Fluids: Composition, Function & Homeostasis				
S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Physiology				
46	Describe the divisions of body fluids into intracellular, extracellular, and intravascular compartments.	Fnd-S1-Phy-14 Body fluids	Interactive Lecture	SBQs & OSVE
47	Recognize the Physiological aspects for the maintenance of homeostasis, ECF, Internal environment, and the role of various body systems in homeostasis.	Fnd-S1-Phy-15 Homeostasis		
48	Explain the concepts of homeostasis and its regulation through the feedback mechanism. Negative feedback, Positive Feedback, Feed-forward Stress & disease	Fnd-S1-Phy-16 Mechanisms of Homeostasis		
Pharmacology				

44	Enlist different routes of drug administration Describe the merits & demerits of the different routes of drug administration	Fnd-S1-Pharm-4 Routes of drug administration	Interactive Lecture	SBQs & OSVE
Pathology				
51	Define cell aging Discuss events in Cellular Aging	Fnd-S1-Path-4 Cell Aging	Interactive Lecture	SBQs & OSVE

Theme 4: Macromolecules/ Fundamental tissues/systems of the Human Body

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
	Define the divisions & functions of skeletal system.			
52	Classify bones on the basis of shape, development, region, structure and microscopic features, gross structure of adult long bone and parts of young long bone.	Fnd-S1-Ana-G5 The skeletal system (classification of bones.)	Demonstration	SBQs, OSPE & OSVE
53	Describe general concepts of development, ossification, and blood supply of bones	Fnd-S1-Ana-G6 Bone development (ossification), Blood supply of long bones		

54	Define the joints. Classify joints based on structure, regions and functions Discuss the characteristics of synovial joints and classify on basis of structure & movement	Fnd-S1-Ana-G7 The joints and its types. The synovial joints.	Interactive Lecture	SBQs & OSVE
55	Define dislocation, sprain and inflammation of joints	Fnd-S1-Orth-1 Fractures	Clinical Interactive Lecture	SBQs & OSVE
56	Describe the microscopic features of epithelial tissues Explain their functional importance and their surface modifications	Fnd-S1-Ana-H-06 The Epithelium	Interactive Lecture	SBQs & OSVE
57	Discuss gross and microscopic features of exocrine glands	Fnd-S1-Ana-H-07 Exocrine glands		
58	Define the composition of the connective tissue. Describe and differentiate the microscopic features of the different types of the connective tissues	Fnd-S1-Ana-H-08 Histology of Connective tissue		

59	Demonstrate histological features of cartilage. Describe the types of the cartilage.	Fnd-S1-Ana-H-09 The cartilage and its types		
60	Identify different types of the epithelia on the light microscope	Fnd-S1-Ana-H-10 Epithelium	Practical	OSPE & OSVE
Physiology				
61	Explain the Physiology experiments and an introduction to Power Lab.	Fnd-S1-Phy-17 Power lab	Practical	OSPE & OSVE
62	Identify the indications of hand washing Demonstrate the protocols and steps of hand washing in sequential manner	Fnd-S1-Phy-18 Hand washing		
Biochemistry				
63	Apply the basic knowledge of carbohydrates in chemistry for health	Fnd-S1-Bio-07 carbohydrates: introduction, classification, and its Biochemical significance	Interactive Lecture	SBQs& OSVE
64	Describe the Biochemical structure of polysaccharides with their clinical importance	Fnd-S1-Bio-08 Monosaccharides: Classification, Structure, Functions		
65	Discuss the functions of carbohydrates in the cell membrane, energy provision and nutrition supply to different parts of the body	Fnd-S1-Bio-09 Chemical Properties & Derivatives of Monosaccharides & their Biochemical Significance in Biological systems		
66	Describe different isomers of monosaccharides e.g. Glactose, Mannose, Fructose, Dextrose.	Fnd-S1-Bio-10 Isomerism: Structural & Optical Isomerism in carbohydrates & their Biochemical significance.		
67	Explain the Structure of disaccharides and oligosaccharides	Fnd-S1-Bio-11 Glycosidic Linkage, Biologically important disaccharides and oligosaccharides		
68	Describe the classification of polysaccharides and their functions.	Fnd-S1-Bio-12 Polysaccharides: Classification, Structure & Functions of Homopolysaccharides		
69	Perform Molisch's Test, Iodine Test, and Benedict's Test to identify an unknown carbohydrate in a given fluid	Fnd-S1-Bio-13 Molisch's Test, Iodine Test, Benedict's Test		OSPE &

70	Detect carbohydrates by different tests	Fnd-S1-Bio-14 Selivanoff's Test, Barfoed's Test, Osazone Test	Practical	OSVE
71	Classify amino acids on the basis of their polarity, charge & nutritional significance.	Fnd-S1-Bio-15 Classification of Amino Acids based on structure, Properties, Nutrition & their role in human metabolism	Interactive Lecture	SBQs & OSVE
72	Describe the physicochemical classification of proteins. Enumerate the functional classification of proteins. Classify proteins on the basis of their axial ratio.	Fnd-S1-Bio-16 Classification of Proteins based on their structures, functions & chemical reactions.		
73	Describe the structural levels of proteins and their important Biochemical features.	Fnd-S1-Bio-17 Structural Organization of Proteins		
74	Able to detect unknown amino acid/protein in a given fluid	Fnd-S1-Bio-18 General Tests for Proteins & Amino acids	Practical	OSPE & OSVE
75	Discuss the significance of Lipids for a balanced diet and Health	Fnd-S1-Bio-22 Lipids: Classification & Biochemical significance.	Interactive Lecture	SBQs & OSVE
76	Able to detect proteins by colour reaction tests	Fnd-S1-Bio-19 Color Reaction Tests of Proteins.	Practical	OSPE & OSVE

77	Able to detect proteins by Separation tests	Fnd-S1-Bio-20 Separation Tests		
78	Able to detect proteins by precipitation tests	Fnd-S1-Bio-21 Precipitation Tests		
79	Able to detect solubility, oily nature, emulsification, saponification tests	Fnd-S1-Bio-23 Tests for Lipids		

Theme 5: Fundamental Tissues/Systems of the Human Body

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
	Define the parts of the skin	Fnd-S1-Ana-G-08		
	Define the appendages of the skin.	Introduction		
82	Recognize the role of the Component Tissues of the Skin and Fascia in Support	Integumentary		
		system (Skin		
		fascia)		

83	Explain the types and functions of blood vessels. (Arteries, veins, capillaries, and Anastomosis)	Fnd-S1-Ana-G-09 Blood vascular system		
84	Integrate the function of the Defense with the structure of the lymph nodes	Fnd-S1-Ana-G-10 Introduction to lymphatic system		
85	Define the types of muscles Describe the internal structure of muscle action, nerve supply and naming of skeletal muscles	Fnd-S1-Ana-G-11 Definition and Classification of muscles		
	Define smooth and cardiac muscles.			
86	Describe the Nervous system and classification of the NS Define the central and peripheral nervous system	Fnd-S1-Ana-G-12 Introduction to the Nervous System	Interactive Lecture	SBQs & OSVE
87	Describe the structure and the structure of the typical spinal nerve.	Fnd-S1-Ana-G-13 Formation and Spinal		
88	Define the autonomic nervous Describe the types and functions of Autonomic Nervous System.	Fnd-S1-Ana-G-14 General Concepts of Autonomic nervous system		
89	Describe the process of Gametogenesis		Fnd-S1-Ana-E-2 Gametogenesis	
90	Discuss ovulation and phases and outcomes of fertilization	Fnd-S1-Ana-E-3 Ovulation Fertilization		
91	Enumerate the events of the first week of development (cleavage and blastocyst formation, and implantation)	Fnd-S1-Ana-E-4 The First week of development		
92	Enumerate the events of the Second	Fnd-S1-Ana-E-5 The second week of		

	amniotic cavity, amniotic membrane, bilaminar embryonic disc, yolk sac, chorionic sac, and primary chorionic villi)	development		
93	Recognize male & female genitalia. Describe the process of fertilization (conception).	Fnd-S1-Cli-G&O-1 Fertilization (The conception)		

Physiology

94	Describe the Physiological Concepts and organization of the nervous system. State general physiological concepts and the organization of the Autonomic Nervous System	Fnd-S1-Phy-19 Introduction Organization of the Nervous System		
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95	Describe the basic Structure and function of neurons & neuroglia Describe the Excitable cells and their types (Synapse)	Fnd-S1-Phy-20 Neuron and neuroglia synaptic transmission	Interactive Lecture	SBQs & OSVE
96	Definition, structure, functions, and types of synapses, Properties of synapse	Fnd-S1-Phy-21 Synapses and neural integration		

Theme 6: Development, Differentiation and Growth

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
98	Explain the main events of third week of development State formation of the primitive streak, Gastrulation and notochord	Fnd-S1-Ana-E-6 Third week of development (Trilaminar germ disc)	Interactive Lecture	SBQs & OSVE
99	Explain formation of neural tube and somite Recognize external appearance of embryo during second month	Fnd-S1-Ana-E-7 Third week to eighth week of development (Embryonic period)		
100	Enlist the derivatives of Ectoderm and neural crest cells	Fnd-S1-Ana-E-08 Derivatives of ectodermal germ layer and neural crest cells		
101	Enlist the derivatives of mesodermal and endodermal germ layers	Fnd-S1-Ana-E-09 Derivatives of Mesodermal and Endodermal germ layers		
102	Describe the development of fetus & parturition	Fnd-S1-Ana-E-10 3 rd month to birth (Fetal Period)		
103	Explain the interchange of substances between maternal and fetal blood by applying the knowledge of structure and functions of placenta and fetal Membranes & clinicals	Fnd-S1-Ana-E-11 Placenta and fetal membranes		
104	Describe the Ectopic pregnancy & its consequences.	Fnd-S1-CL-O&G-2 Ectopic pregnancy		

Theme 7: Genetics and Developmental Anomalies

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				

105	Define teratogenesis and the basic principles of teratogenesis. Categorize the common teratogens	Fnd-S1-Ana-E-12 Teratogenesis	Interactive Lecture	SBQs & OSVE
106	Explain the types of twin/ multiple pregnancies and their clinical significance	Fnd-S1-Ana-E-13 Twin pregnancy		
107	Calculate the expected date of delivery (EDD) Describe various methods used to Assess fetal well-being	Fnd-S1-Gyn & Obs-3 The Fetal wellbeing & EDD		
Biochemistry				
108	Enlist different types of nucleotides and their basis in genetics.	Fnd-S1-Bio-24 Structure and types of nucleotides.	Interactive Lecture	SBQs & OSVE
109	Enlist different types of nucleotides and their basis in genetics	Fnd-S1-Bio-25 Structure of DNA & RNA	Interactive Lecture	SBQs & OSVE
Physiology				
110	Describe the Physiological basis of genes and functions of DNA and RNA	Fnd-S1-Phy-22 DNA, Gene, Genetic code RNA, Types, Codan, anti Codan	Interactive Lecture	SBQs & OSVE
		Fnd-S1-Phy-23 Control of gene functions		
Pathology				
114	Define Mutation and its types. Classification of genetic disorders Define Mendelian Disorders	Fnd-S1-Path-5 Introduction to genetic disorder	Interactive Lecture	SBQs & OSVE
115	Describe the normal Karyotype Discuss various numerical and structural abnormalities of chromosomes	Fnd-S1-Path-6 Chromosomal aberration.		
116	Describe the causes and pathogenesis of congenital fetal abnormalities	Fnd-S1-Path-7 Congenital fetal abnormalities		

HAEMATOLOGY MODULE-1

Introduction welcome to the hematology module. this module aims to provide the basic understanding of hematopoiesis and hemostasis at the molecular level. this module is designed to learn and integrate basic knowledge of blood cells, with clinical relevance. this module is designed to make your learning both interesting and productive by including more practical activities. it will deal with the basic patho-physiological and pharmacological aspects of infections and chemo therapeutic agents and integrate it with clinical sciences.

The module will give the 1st year medical students an opportunity to know the presentations and principles of management of common hematological, immunological, inflammatory and neoplastic disorders. You will be expected to

think about the scenarios and participate in case-based learning sessions for clearing your concepts and better learning. It will also help you focus your attention on what you need to achieve from the Interactive Lectures, practical and tutorials that have been scheduled in this module.

DURATION: 8 weeks Learning

outcomes

- Knowledgeable
- Skillful
- Community Health Promoter
- Problem-solver
- Professional
- Researcher
- Leader and Role Model

COGNITIVE DOMAIN: By the end of this module, first year MBBS students shall be able to:

- Identify & describe the various cellular and non-cellular components of blood in relation to its Anatomy, Physiology & Biochemistry
- Describe structure, synthesis and degradation of Hemoglobin
- Describe the regulatory mechanisms of normal hemostasis and coagulation
- Describe the conditions associated with dysfunction of cellular and non-cellular components of blood
- Describe the basic characteristics of immune system.
- Discuss the structure, functions and Biochemical aspects of the Lympho-reticular system.
- Explain the principles and clinical significance of ABO/RH blood grouping system
- Explain the Patho-Physiology of various bleeding disorders
- Identify the role of Pharmacology in inflammation, anemia and bleeding disorders.

PSYCHOMOTOR DOMAIN

Description of the psychomotor skills to be developed and the level of performance required: By the end of this Module, the student should be able to:

- Carry out practical work as instructed in an organized and safe manner
- Make and record observations accurately.
- Determine percentage of formed blood elements (Hematocrit).
- Identify RBC and should be able to do its counting-on-counting chamber and to know normal values. And also classify Anemia morphologically.
- Determine the Hemoglobin with the apparatus and have knowledge of normal and abnormal value.
- Identify WBC morphology and its different types, should be able to count them on counting chamber and to know the normal values. Diagnostic importance of each WBC.
- Identify Platelets and should be able to know normal values. Its diagnostic importance in relation to bleeding disorders
- Perform bleeding time and clotting time and to know normal values and its diagnostic importance in relation to bleeding disorders.
- Perform Blood groups typing and Rh factor.
- Perform ESR and to know its normal value and prognostic importance.

ATTITUDE AND BEHAVIOUR:

By the end of Module, the student shall gain the ability and carry responsibility to:

- Demonstrate ability to give and receive feedback, respect for self and peers.
- Demonstrate sympathy and care to patients.
- Having respect for patients, colleagues and other health professionals
- Organize & distribute tasks
- Exchange opinion & knowledge
- Develop communication skills with sense of responsibility.
- Regularly attend the classes
- Demonstrate good laboratory practices

Laboratory Skills (Physiology & Pathology):

By the end of Module, the students should be able to:

- Describe types & methods of sterilization
- Collect blood sample by various methods i.e. pricking method & venipuncture on dummies
- Prepare blood film & Identify and quantify different types of white blood cells on blood film
- Identify different blood groups
- Antigen-Antibody reactions in the Laboratory
- Determine hemoglobin concentration (Sahli's method)
- Laboratory diagnosis of Anemias
- Estimate bleeding time, clotting time (BT & CT)
- Laboratory diagnosis of Bleeding Disorders
- Estimate erythrocyte sedimentation rate (ESR by wester green method)
- Non. Neoplastic WBC Disorders
- Acute Inflammation/ Chronic inflammation
- Repair: Wound Healing
- Isolation of micro-organism/Lab diagnosis of infectious disease
- Culture Media-I & Culture Media-II

Clinical Skills: By the end of Module, the students should be able to:

1. Practice history taking: patients with anemia and bleeding disorders
2. Define and classify polycythemia
3. Define and describe the different types of anemia
4. Describe various types of blood indices

Themes

- Theme 1: Red cell disorders (Anemia, Polycythemia)
- Theme 2: Infections & Inflammation
- Theme 3: Bleeding & thromboembolic disorders
- Theme 4: ABO & Rh-Incompatibility
- Theme 5: Immunological disorders

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES				
Theme 1: Red cell disorders (Anemia, Polycythemia)				
S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				

1	<ul style="list-style-type: none"> Illustrate the organization of hematopoietic tissue Enlist the sites and sources of hematopoiesis before and after the birth. 	Hem-S1-E1-Ana- Development of blood	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> Examine the structure of RBC, WBC & platelets. Illustrate methods used to study blood and bone marrow cells. 	Hem-S1-H1-Ana- Morphology of blood cells	Interactive Lecture/ Practical	SBQs & OSPE & OSVE
Physiology				
3	<ul style="list-style-type: none"> Discuss the cellular components of blood Define hematocrit, normal values & factors affecting hematocrit 	Hem-S1-Phy-1 Composition of blood & its cellular components	Interactive Lecture	SBQs & OSVE
4	<ul style="list-style-type: none"> Discuss the various stages of RBC'S formation. Discuss various sites of erythropoiesis Enlist the factors necessary for erythropoiesis. Discuss the significance of Reticulocyte count 	Hem-S1-Phy-2 Development of RBCs (Erythropoiesis)		
5	<ul style="list-style-type: none"> Examine concentration by Sahli's method 	Hem-S1-Phy-3 hemoglobin concentration (Sahli's method)	Practical	OSPE & OSVE
6	<ul style="list-style-type: none"> Estimate erythrocyte sedimentation rate (ESR by wester green method) 	Hem-S1-Phy-4 Estimation of erythrocyte sedimentation rate (ESR by the wester green method)		
Biochemistry				
7	<ul style="list-style-type: none"> Explain the Biochemical basis for the difference in plasma & serum. Describe composition of blood & plasma protein. 	Hem-S1-Bio-1 Composition of blood & plasma proteins (Specialized body fluid)	Interactive Lecture	SBQs & OSVE
8	<ul style="list-style-type: none"> Describe Chemistry & synthesis of Heme Explain structure, types & forms of Hb. 	Hem-S1-Bio-2 Normal Hemoglobin		
9	<ul style="list-style-type: none"> Identify abnormalities of Heme Synthesis (Porphyrias & its types). 	Hem-S1-Bio-3 Abnormal Heme		

10	<ul style="list-style-type: none"> Explain the Biochemical aspects of hemoglobinopathies. (Thalassemia, sickle cell anemia) 	Hem-S1-Bio-4 Abnormal Hemoglobin (Hemoglobinopathies)		
11	<ul style="list-style-type: none"> Describe degradation of heme. Explain bile pigments, formation, types,, transport & Excretion of bile. 	Hem-S1-Bio-5 Degradation of Heme		
12	<ul style="list-style-type: none"> Discuss Iron Metabolism & identify its abnormalities. 	HemM-S1-Bio-6 Iron Metabolism		
13	<ul style="list-style-type: none"> Explain the Biochemical importance of Vitamin B12 & Folic acid & their associated diseases. 	Hem-S1-Bio-7 Vitamin B12 & Folic acid		
14	<ul style="list-style-type: none"> Describe importance of Vitamin K & E & their associated diseases. 	Hem-S1-Bio-8 Vitamin K & E		
Pathology				
15	<ul style="list-style-type: none"> Describe classification of Anemia Differentiate the different types of anemias on the basis of Morphology & Patho-Physiology. 	Hem-S1-Path-1 Introduction of Anemia	Interactive Lecture	SBQs & OSVE
16	<ul style="list-style-type: none"> Identify the types of nutritional Anemias Enlist causes of iron deficiency, Anemia & clinical features and Laboratory diagnosis 	Hem-S1-Path-2 Iron deficiency Anemia		
17	<ul style="list-style-type: none"> Enlist causes of vitamin D-12 and folate deficiency Explain the Pathophysiology, clinical features and laboratory diagnosis. 	Hem-S1-Path-3 Megaloblastic Anemia		
Pharmacology				
18	Describe role of oral & injectable iron in iron deficiency anemia	Hem1-S1-Pharm-1 Drugs for iron deficiency anemia	Interactive Lecture	SBQs & OSVE
19	Describe role of Vit. B12 & Folic acid in Macrocytic anemia	Hem1-S1-Pharm-2 Drugs for Megaloblastic anemia		

Theme 2: Infections & Inflammation

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
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Anatomy				
21	<ul style="list-style-type: none"> Discuss the embryological source of lymphoid organs 	Hem-S1-E2-Ana- Development of lymphoid organs	Interactive Lecture	SBQs & OSVE
22	<ul style="list-style-type: none"> Discuss the components, location & structure of lymphoid issue. Describe parts, surfaces and relations of Lymphoid organs 	Hem-S1-G1-Ana- Gross features of lymphoid organs	Demonstration	SBQs, OSPE & OSVE
23	<ul style="list-style-type: none"> Discuss the histological classification & microscopic features of lymphoid organs. 	Hem-S1-H3-Ana Microscopic anatomy of lymphoid organs	Interactive Lecture	SBQs & OSVE
24	<ul style="list-style-type: none"> Define histological features of spleen & lymph node. 	Hem-S1-H4-Ana- Spleen & Lymph node	Practical	OSPE & OSVE
25	<ul style="list-style-type: none"> Define histological features of Thymus gland & Tonsil. 	Hem-S1-H5-Ana- Thymus & Tonsil		
Physiology				
26	<ul style="list-style-type: none"> Describe the process of leukocyte genesis, enlist various types of granulocytes and agranulocytes, their functions & normal values Explain the significance of Reticuloendothelial system Discuss the functions of T and B lymphocytes. 	Hem-S1-Phy-5 Genesis and general characteristics, and functions of white blood cells	Interactive Lectures/ Small Group Discussion	SBQs, OSPE & OSVE
Pathology				
27	<ul style="list-style-type: none"> Define acute inflammation. Describe the changes systemic effects & occurring in acute inflammation. 	Hem-S1-Path-4 Overview of acute and chronic inflammation	Interactive Lecture	SBQs & OSVE
28	<ul style="list-style-type: none"> Describe causes of Neutrophilia and Neutropenia, Eosinophilia Lymphocytosis, Monocytosis 	Hem-S1-Path-5 Non-Neoplastic WBC Disorders		

Theme 3: Bleeding & thromboembolic disorders

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Physiology				
42	<ul style="list-style-type: none"> Describe the four-basic mechanism of Hemostasis, Explain the mechanism of formation of platelet plug. 	Hem-S1-Phy-6 Hemostasis & role of Thrombocytes		

43	<ul style="list-style-type: none"> Explain steps involved in intrinsic and extrinsic pathway for coagulation, Enlist the clotting factors, to describe the role of clotting factors in coagulation. 	Hem-S1-Phy-7 Clotting cascade & bleeding disorders	Interactive Lectures/Small Group Discussion	SBQs, OSPE & OSVE
Biochemistry				
44	<ul style="list-style-type: none"> Describe importance of Vitamin K & E & their associated diseases. 	Hem-S1-Bio-9 Vitamin K & E	Interactive Lecture	SBQs & OSVE
Pathology				
45	<ul style="list-style-type: none"> Discuss the different types of bleeding disorders. 	Hem-S1-Path-6 Platelet and Bleeding disorder	Interactive Lecture	SBQs & OSVE
	<ul style="list-style-type: none"> Discuss Quantitative & Qualitative platelets disorders Describe classification & Lab. diagnosis of hemophilia and Von Willebrand disease. 			
46	<ul style="list-style-type: none"> Discuss thrombosis, pathogenesis, types and fate of thrombosis. 	Hem-S1-Path-7 Thrombosis		
47	<ul style="list-style-type: none"> Define embolism, its types and morphological features of embolism. 	Hem-S1-Path-8 Embolism		

Theme 4: ABO & Rh-Incompatibility

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Physiology				
49	<ul style="list-style-type: none"> Describe the antigens & antibodies for A,B,AB & O blood groups Define Agglutinin, agglutination, and what takes place when incompatible blood types are mixed. Identify universal donor & recipient & explain why? Enlist various Rh antigens & Rh immune response. What is erythroblastosis fetalis & how it can be prevented 	Hem-S1-Phy-8 Blood groups ABO/RH system	Interactive Lectures/Small Group Discussion/Practical	SBQs, OSPE & OSVE
Pathology				
50	Recognize different types of blood transfusion reaction.	Hem-S1-Path-9 Blood Transfusion	Interactive Lecture	SBQs & OSVE

Theme 5: Immunological Disorders

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Physiology				
51	<ul style="list-style-type: none"> Discuss the overall organization of the immune system Differentiate between innate & acquired immunity, Discuss cell-mediated immunity and humoral immunity, active and passive immunity. 	Hem-S1-Phy-9 Immunity.	Interactive Lectures/ Small Group Discussion	SBQs, OSPE & OSVE
Biochemistry				
52	<ul style="list-style-type: none"> Define Immunoglobulins. Describe chemistry, structure & their classification. 	Hem-S1-Bio-10 Immunoglobins	Interactive Lecture	SBQs & OSVE
Pathology				
55	<ul style="list-style-type: none"> Define hypersensitivity Describe the Pathogenesis of Type-I & II hypersensitivity reactions with examples 	Hem-S1-Path-10 Hypersensitivity reaction Type I & II	Interactive Lecture	SBQs & OSVE

56	<ul style="list-style-type: none"> Describe type III & IV hypersensitivity reactions with examples. 	Hem-S1-Path-11 Hypersensitivity reaction Type III & IV		
58	<ul style="list-style-type: none"> Discuss primary immunodeficiency and its causes Discuss secondary immunodeficiency and its causes 	Hem-S1-Path-12 Immunodeficiency		
Pharmacology				
59	<ul style="list-style-type: none"> Associate role immune immune-modulating drugs in autoimmune disorders 	Hem-S1-Pharm-4	Interactive Lecture	SBQs & OSVE

MUSCULOSKELETAL MODULE - 1

Introduction This exciting module will serve as building block and is very essential to your future work as doctors. This module is designed to make your learning both interesting and productive by including several interactive activities. Motility is the most important feature of life. Every living being shows locomotion in one or other form. Human locomotor system is very beautiful and well organized. Man is the only mammal that walks on two feet. So, our musculoskeletal

system is well oriented to counter the effect of gravity. God Himself has said in Holy Quran that He has made man in the best of its form. Cerebral cortex, the highest center of brain causes controls various body movements by coordination of the muscles, bones, & joints.

Rationale This module is designed to build a solid foundation regarding knowledge of the structure and function of various muscles, bones and joints. This also provides information regarding its clinical applications. It has been estimated that one in four consultations in primary care is caused by problems of the musculoskeletal system.

It is likely that individuals at some time suffer from a problem related to the musculoskeletal system, ranging from a very common problem such as osteoarthritis or back pain to severely disabling limb trauma or rheumatoid arthritis. Many musculoskeletal problems are chronic conditions as well. The most common symptoms are pain and disability, with an impact not only on individuals' quality of life but also, importantly, on people's ability to earn a living and be independent.

Throughout this module, students will have the opportunity to link basic science knowledge to clinical problems. Teaching relevant basic sciences with clinical examples will help you make connections among concepts and retain the information for later clinical education.

Duration 10 weeks

Learning Outcomes

By the end of this module, the students should be able to describe, demonstrate & explain

Knowledge

- Muscles, bones, joints, fascia, fossa, compartments, nerves and blood vessels of upper limb
- Muscles, bones, joints, fascia, fossa, compartments, nerves and blood vessels of Lower limb
- Microscopic features of muscles, bones, cartilages, and skin.
- Collagen metabolism and collagen disorders.
- Development of muscles and bones & their congenital anomalies
- Fractures& their healing, bone remodeling, osteoporosis & its management.
- Nerve palsies and disability
- Pain Physiology and pain management including analgesics.
- Scheme & control of motor activity, motor cortical areas, motor pathways, and role of cerebellum and basal ganglia in motor activity.
- Mechanism of contraction of skeletal muscle & its molecular basis
- Muscle glycogen metabolism and glycogen storage diseases
- Neuromuscular junction, abnormalities of transmission across it, and drugs affecting this transmission
- Calcium homeostasis, role of hormones and their abnormalities
- Nutrition & adaptation of muscles in exercise
- Epidemiology of road accidents, their prevention, disability and rehabilitation
- Functions of skin, its common disorders and their treatment

Skills

- Histology of Cartilage
- Introduction to power lab
- Histology of Muscles
- Simple muscle twitch & summation
- The muscular twitch response and recruitment
- Physiological properties of skeletal muscle
- EMG
- Estimation of calcium
- Estimation of Phosphorus
- Fractures

Attitude Follow the basic laboratory protocols

- Participate in class and practical work professionally
- Communicate effectively in a team with peers, staff and teachers
- Demonstrate professionalism and ethical values in dealing with patients, cadavers, peers, staff and teachers.
- Communicate effectively in a team with peers and teachers.
- Demonstrate the ability to reflect on the performance.

Themes

- Theme 1: Theme 1: Pectoral region and Breast
- Theme 2: Back, Axilla and Shoulder joint
- Theme 3: Brachial Plexus and Arm
- Theme 4: Forearm, hand, and carpal tunnel syndrome
- Theme 5: Anterior thigh and femoral hernia
- Theme 6: Gluteal region, hip joint and Sciatic nerve
- Theme 7: Anterior compartment of leg and compartment syndrome Theme 8: Posterior compartment of leg and foot

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES				
Theme 1: Pectoral region and Breast				
S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
1	<ul style="list-style-type: none"> • Define different regions of the upper limb • Identify various compartments of arm, forearm & hand. • Define the axial and appendicular skeleton and define the girdle bones. • Identify joints of the upper limb. 	MSK-S1-Ana-G-1 Introduction to locomotor system & Organization of upper limb		

2	<ul style="list-style-type: none"> Define the pectoral region. Describe its muscles. Identify the general features and different landmarks for side determination and the attachments of various muscles on the clavicle. 	MSK-S1-Ana-G-2 Pectoral region & the clavicle	Demonstration	SBQs, OSPE & OSVE
3	<ul style="list-style-type: none"> Discuss the development of Bone 	MSK-S1-Ana-E-1	Interactive	SBQs & OSVE

	<ul style="list-style-type: none"> Describe Intramembranous ossification Describe endochondral ossification Describe ossification of the limb bones Describe the development of the joints Describe the development of the cartilage 	Development of the skeletal system	Lecture	
4	<ul style="list-style-type: none"> Identify general features and different landmarks for side determination and the attachments of various muscles on the Scapula. Define arrangement, attachments, neurovascular bundle, and actions of the muscles of the back 	MSK-S1-Ana-G-3 Scapular region (scapula bone, muscles & Neurovascular bundle of back)	Demonstration	SBQs, OSPE & OSVE
5	<ul style="list-style-type: none"> Identify the bony components, type & variety & movements of sternoclavicular, acromioclavicular joints 	MSK-S1-Ana-G-4 Sternoclavicular Acromioclavicular Joints		
6	<ul style="list-style-type: none"> Define the extent and quadrants of the breast Describe the blood supply and lymphatic drainage of the breast in the female with its clinical significance. 	MSK-Ana-G-5 Anatomy of the breast	Interactive Lecture	SBQs & OSVE
7	<ul style="list-style-type: none"> Identify histology of mammary gland in non-lactating, lactating & during pregnancy under microscope. Identify and describe histological features of nipple and areola. 	MSK-S1-Ana-H-1 Histology of breast	Practical	OSPE & OSVE
Physiology				
8	<ul style="list-style-type: none"> Describe the Physiology of Mammary gland. Describe the Hormone responsible for milk production & ejection. Describe the let-down reflex (milk ejection reflex) 	MSK-S1-Phy-1 Physiology of breast and lactation		

9	<ul style="list-style-type: none"> Discuss the basic relationship between vitamin D, PTH, calcium and Phosphate in relation to bone formation Describe the various cells of the bones and their function in Calcium homeostasis 	MSK-S1-Phy-2 Hormones regulating calcium homeostasis	Interactive Lecture	SBQs & OSVE
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10	<ul style="list-style-type: none"> Identify and name various parts of power lab Illustrate the functions of various parts of the power lab 	MSK-S1-Phy-P1 Introduction to Power Lab	Practical	OSPE & OSVE
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Biochemistry

11	<ul style="list-style-type: none"> Enlist classification, functions and Biochemical significance of Hetero polysaccharides in formation of Extracellular Matrix. 	MSK-S1-Bio-01 Role of Hetero polysaccharides (Glycosaminoglycans)	Interactive Lecture	SBQs & OSVE
12	<ul style="list-style-type: none"> Explain Muco-polysaccharidoses: Classification, Deficient Enzymes Clinical Manifestation 	MSK-S1-Bio-02 Muco- polysaccharidoses		
13	<ul style="list-style-type: none"> Discuss the general introduction and classification of Minerals. 	MSK-S1-Bio-03 Classification of Minerals		

Clinical Lecture

14	<ul style="list-style-type: none"> Define bone density and factors that are responsible for maintaining bone density Define Pathogenesis and clinical course of change in bone density and conditions associated with lactation. Discuss its complications and management. 	MSK-S1-Gyn & Obs-1 Changes in bone density with lactation	Interactive Lecture	SBQs & OSVE
15	<ul style="list-style-type: none"> Describe the Pathophysiology of mammary gland disorders Describe the lactation reflex Describe weaning Describe the hormonal effect Student guide for complete protocol of lactation and weaning 	MSK-S1-Paeds-1 Breast feeding guide for medical profession		

Theme 2: Back, Axilla and Shoulder joint

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				

16	<ul style="list-style-type: none"> Describe the attachments, nerve supply and the actions of the back muscles. Define the effects of paralysis of these muscles 	MSK-S1-Ana-G-6 Muscles of back	Demonstration	SBQs, OSPE & OSVE
17	<ul style="list-style-type: none"> Discuss the arterial anastomosis around the scapula. Explain the neurovascular bundle of scapula. 	MSK-S1-Ana-G-7 Anastomosis around scapula & Neurovascular bundle of scapula		
18	<ul style="list-style-type: none"> Enumerate bony components, type & variety, attachment of 	MSK-S1-Ana-G-8 The Shoulder Joint	Interactive Lecture	SBQs & OSVE

	<p>capsule and ligaments of this joint.</p> <ul style="list-style-type: none"> Demonstrate various muscles & movements at the joint. Identify the factors stabilizing or weakening the shoulder joint. 			
19	<ul style="list-style-type: none"> Discuss the developmental stages of skull and its clinicals 	MSK-S1-Ana-E-2 Development of skull		
20	<ul style="list-style-type: none"> Define the shape, location, boundaries, and contents of the Axilla. Discuss the formation, course, and relations of axillary vessels Describe the arrangement of axillary lymph nodes and their area of drainage. 	MSK-S1-Ana-G-9 Axilla: Boundaries & Contents	Demonstration	SBQs, OSPE & OSVE
21	<ul style="list-style-type: none"> Describe and draw formation of the brachial plexus. Mention different parts of brachial plexus and their location. Identify different nerves with their root values. Discuss the effects of injury to different sites of brachial plexus. 	MSK-S1-Ana-G-10 Brachial Plexus	Interactive Lecture	SBQs & OSVE

22	<ul style="list-style-type: none"> Identify the skeletal muscle under a light microscope Describe the structural basis of muscle striations. Recognize the structural elements that produce muscle contraction and brings the movement of a body part. 	MSK-S1-Ana-H-2 Histology of skeletal muscle	Practical	OSPE & OSVE
Physiology				
23	<ul style="list-style-type: none"> Describe the distribution of calcium in the bones. Describe the mechanism by which Ca is released in blood from Bone 	MSK-S1-Phy-3 Role of Calcium in bones	Interactive Lecture	SBQs & OSVE
24	<ul style="list-style-type: none"> Describe and classify properties of various types of muscle. Describe the structure, functions and arrangements of Myosin, Actin, Troponin & Tropomyosin filaments 	MSK-S1-PHY-4 Properties of muscles & structure of skeletal muscles.		
Biochemistry				

25	<ul style="list-style-type: none"> Describe sources, RDA, Absorption, transport, Functions, Clinical Aspects 	MSK-S1-Bio-4 Calcium metabolism.	Interactive Lecture	SBQs & OSVE
26	<ul style="list-style-type: none"> Describe sources, RDA, Absorption, transport, Functions, Clinical Aspects 	MSK-S1-Bio-5 Magnesium & Phosphorus Metabolism		
27	<ul style="list-style-type: none"> Describe sources, RDA, Absorption, Transport, Functions, Clinical Aspects 	MSK-S1-Bio-6 Vitamin D metabolism.		
28	<ul style="list-style-type: none"> Describe miscellaneous minerals: Iodine, Fluoride, Selenium, Cobalt, Zinc, Copper 	MSK-S1-Bio-7 Miscellaneous Minerals		
29	<ul style="list-style-type: none"> Discuss role of Parathyroid, Calcitonin & Vitamin D 	MSK-S1-Bio-8 Regulation of Calcium & PO ₄ Metabolism		
30	<ul style="list-style-type: none"> Discuss chemical composition of bone, remodeling and normal composition of synovial fluid. 	MSK-S1-Bio-9 Chemical composition of bone		

31	<ul style="list-style-type: none"> Demonstrate importance of calcium as macro-mineral. RDA, Absorption, factors influencing absorption. clinical manifestation of excess and deficiency states. 	MSK-S1-Bio-10 Estimation of serum calcium	Practical	OSPE & OSVE
Pathology				
32	<ul style="list-style-type: none"> Define Vitamin D Explain significance of vitamin D in the body Describe the different deficiency states related to vitamin D Discuss the prevention of Vitamin D Deficiency 	MSK-S1-Path-1 Vitamin D deficiency	Interactive Lecture	SBQs & OSVE
Pharmacology				
33	<ul style="list-style-type: none"> 	MSK-S1-Pharm-1 Introduction to Cholinergic	Interactive Lecture	SBQs & OSVE

Theme 3: Brachial Plexus and Arm

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESEMNT
Anatomy				
34	<ul style="list-style-type: none"> Explain the arrangement of different functional groups of muscles in the anterior compartment of the arm & their attachment Demonstrate the actions of the above muscles Describe the neurovascular structures and their important relations 	MSK-S1-Ana-G-11 Humerus bone Anterior compartment of the arm	Demonstration	SBQs, OSPE & OSVE
35	<ul style="list-style-type: none"> Define cubital fossa. Discuss its boundaries Clinical correlates 	MSK-S1-Ana-G-12 Cubital fossa	Interactive Lecture	SBQs & OSVE
36	<ul style="list-style-type: none"> Explain the arrangement of different functional groups of muscles in the post-compartment arm & their attachment Demonstrate the actions of muscles Describe neurovascular structures and their important relations 	MSK-S1-Ana-G-13 Posterior compartment of the arm & the Elbow joint	Demonstration	SBQs, OSPE & OSVE

37	<ul style="list-style-type: none"> Identify general features of the radius & ulna. Discuss attachments of various muscles on the radius & ulna. Discuss the radioulnar joints. 	MSK-S1-Ana-G-14 Radius & Ulna (radioulnar joints)	Demonstration	SBQs, OSPE & OSVE
38	<ul style="list-style-type: none"> Explain the arrangement of different functional groups of muscles in the anterior compartment of the fore-arm & their attachment. Describe neurovascular structures and their important relations 	MSK-S1-Ana-G-15 Anterior compartment of the forearm		
39	<ul style="list-style-type: none"> Explain the arrangement of different functional groups of muscles in the posterior compartment of forearm & their attachment. Describe neurovascular structures and their important relations 	MSK-S1-ANA-G- 16 Posterior compartment of forearm		
40	<ul style="list-style-type: none"> Describe ossification of vertebra, ribs & sternum, and its clinicals 	MSK-S1-Ana-E-3 Development of vertebra, ribs, & sternum.	Interactive Lecture	SBQs & OSVE

41	<ul style="list-style-type: none"> Identify smooth and cardiac muscles under light microscope Describe structural basis of muscle striations & differentiate between the two muscles. Recognize function and organization of the connective tissue in muscle. 	MSK-S1-Ana-H-3 Histology of smooth and cardiac muscles	Practical	OSPE & OSVE
Physiology				
42	<ul style="list-style-type: none"> Describe general mechanism of skeletal muscle contraction. Describe molecular mechanism (sliding filament theory) of skeletal muscle contraction. Describe walk along theory– power stroke. Define motor unit, isotonic & isometric contraction 	MSK-S1-Phy-5 Mechanism & different theories of muscle contraction Types of muscle contraction	Interactive	

43	<ul style="list-style-type: none"> Define neuromuscular junction (NMJ) & list the components of NMJ Explain sequence of events of neuromuscular transmission 	MSK-S1-Phy-6 Neuromuscular Junction & transmission	Lecture	SBQs & OSVE
44	<ul style="list-style-type: none"> Define end plate potential Describe excitation contraction coupling Explain myasthenia gravis 	MSK-S1-Phy-7 Excitation contraction coupling		
45	<ul style="list-style-type: none"> Demonstrate Nerve conduction velocity Explain how electrical events are converted to mechanical events 	MSK-S1-Phy-P2 Action potential	Practical	OSPE & OSVE
Biochemistry				
46	<ul style="list-style-type: none"> Demonstrate sources, daily requirements, intestinal absorption, transport and Biochemical role and regulation of Vit-D3 	MSK-S1-Bio-11 Estimation of Serum Vit.D3	Practical	OSPE & OSVE
Clinical Lecture				
48	<ul style="list-style-type: none"> Enlist disorders of skeletal muscle disorders and the factors that are responsible for it Define Pathogenesis and clinical course of conditions associated with skeletal muscle disorders Discuss its complications and management 	MSK-S1-Ortho-1 Disorders of voluntary muscles	Interactive Lecture	SBQs & OSVE

Theme 4:

Forearm, Hand, and Carpal Tunnel Syndrome

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
53	<ul style="list-style-type: none"> Describe the location, destination, course & relations of arteries & their branches in upper limb. Identify and discuss the deep veins of the upper limb. Describe the location, destination, course & relations of nerves & their branches in upper limb. 	MSK-S1-Ana-G-17 Neuromuscular bundle of the upper limb	Demonstration	SBQs, OSPE & OSVE

54	<ul style="list-style-type: none"> Describe the type, variety, and attachment of capsule and ligaments of this joint. demonstrate various movements at this joint. Describe the structural organization of the Flexor & Extensor Retinaculum. Discuss carpal tunnel syndrome. 	MSK-S1-Ana-G-18 Wrist joint	Interactive Lecture	SBQs & OSVE
55	<ul style="list-style-type: none"> Describe the bony arrangement of the hand. Describe the joints of the hand. 	MSK-S1-Ana-G-19 Osteology of the hand and the joints of the hand.		
56	<ul style="list-style-type: none"> Discuss the cutaneous supply, arteries & veins of the palm of the hand. define fibrous flexor sheath. Define the palmar aponeurosis, facial spaces. Describe small muscles of the hand. 	MSK-S1-Ana-G-20 Palm	Demonstration	SBQs, OSPE & OSVE
57	<ul style="list-style-type: none"> Discuss the dorsal venous arch. Describe the insertion of the long extensor tendons. 	MSK-S1-Ana-G-21 Dorsum of the hand		
58	<ul style="list-style-type: none"> Describe different regions of lower limb. Identify the various bones forming skeleton of lower limb. Describe general arrangement of superficial & deep fasciae of lower limb Demonstrate the bones of pelvic girdle. Identify different landmarks in different regions of lower limb 	MSK-S1-Ana-G-22 Introduction to lower limb / Organization of skeleton of lower limb	Interactive Lecture	SBQs & OSVE
59	<ul style="list-style-type: none"> Identify the superficial arteries of 	MSK-S1-Ana-G-23	Demonstration	SBQs, OSPE &

	<ul style="list-style-type: none"> lower limb Name and discuss superficial veins of lower limb Highlight the course of great and small saphenous vein Describe the superficial lymphatic vessels & lymph nodes of lower limb Discuss clinical correlates. 	Superficial veins, arteries, lymph nodes & cutaneous supply of the lower limbs		OSVE
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60	<ul style="list-style-type: none"> Describe the development of skeletal muscle. Discuss the development of Myotomes List derivatives of Ebaxial and Primaxial divisions of myotomes 	MSK-S1-ANA-E-4 Development of skeletal muscles	Interactive Lecture	SBQs & OSVE
61	<ul style="list-style-type: none"> Classify bone on developmental and structural basis. Differentiate between woven bone and lamellar bone under microscope. Differentiate between compact bone and spongy bone under microscope. 	MSK-S1-Ana-H-4 Histology of bones	Practical	OSPE & OSVE
Physiology				
62	<ul style="list-style-type: none"> Demonstrate SMT on power lab What are the different periods of SMT & their duration? Demonstrate the phenomenon of fatigue & Tetanus 	MSK-S1-Phy-P3 Muscular twitch response	Practical	OSPE & OSVE
63	<ul style="list-style-type: none"> Describe types of muscle fibers (type I and II) Determine effect of exercise on muscle blood flow State effect of training, stamina and resistance on muscle fibers State Hypoxia, muscle Fatigue during exercise and, its Biochemical reasons. 	MSK-S1-Phy-8 Muscle adaptation to exercise	Interactive Lecture	SBQs & OSVE
64	<ul style="list-style-type: none"> Explain aerobics and anaerobic exercise and effect of exercise on muscles. 	MSK-S1-Phy-9 Role of muscle in exercise		
Biochemistry				
65	<ul style="list-style-type: none"> Describe the Collagen Structure and synthesis, Types, Role of vitamin C in synthesis of Collagen 	MSK-S1-Bio-12 Collagen Structure and synthesis	Interactive Lecture	SBQs & OSVE
66	<ul style="list-style-type: none"> Brief overview of inherited Collagen Disorders and their clinical manifestation 	MSK-S1-Bio-13 Overview of inherited Collagen disorders		
67	<ul style="list-style-type: none"> Estimation, RDA, Effects, regulation and clinical manifestation of excess and deficiencies. 	MSK-S1-Bio-14 Estimation of serum phosphorus	Practical	OSPE & OSVE

69	<ul style="list-style-type: none"> Classify different muscle relaxants. Discuss mechanism of their action Explain clinical uses and their diverse effects 	MSK-S1-Pharm-2 Drugs used as Skeletal muscle relaxant		
Clinical Lecture				
70	<ul style="list-style-type: none"> Define osteoporosis Describe generalized and localized osteoporosis Enlist primary & secondary causes of generalized osteoporosis Define Pathogenesis and clinical course Discuss its complications and management 	MSK-S1-Ortho-2 Clinical manifestation of Osteoporosis	Interactive Lecture	SBQs & OSVE

Theme 5: Anterior thigh and femoral hernia Theme 6: Gluteal region, hip joint, and Sciatic nerve				
S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
71	<ul style="list-style-type: none"> Identify parts of the hip bone. Determine side of the bone. Describe the general features of each part of the hip bone. Identify the bone. Determine the side of the bone. Describe the anatomical position of the bone. 	MSK-S1-Ana-G-24 Hip bone + Femur	Demonstration	SBQs, OSPE & OSVE
72	<ul style="list-style-type: none"> Discuss the division of the thigh into compartments Enumerate muscles of the anterior compartment of the thigh and their respective actions. Describe the innervation and blood supply of the muscles of the anterior compartment. 	MSK-S1-Ana-G-25 Anterior compartment of the thigh		
73	<ul style="list-style-type: none"> Describe the Femoral triangle, its boundaries, and contents. Discuss the femoral sheath and its contents, and the clinical conditions associated. 	MSK-S1-Ana-G-26 Femoral triangle	Interactive Lecture	SBQs & OSVE

74	<ul style="list-style-type: none"> Describe the development of smooth and cardiac muscle. Discuss the development of Myotomes Enlist derivatives of epaxial and hypaxial divisions of myotomes 	MSK-S1-Ana-E-5 Development of smooth & cardiac muscles		
75	<ul style="list-style-type: none"> Discuss muscles of the medial compartment of the thigh. Discuss the blood & nerve supply of these muscles. Describe actions of the muscles of medial compartment of thigh. 	MSK-S1-Ana-G-27 Medial compartment of thigh	Demonstration	SBQs, OSPE & OSVE
76	<ul style="list-style-type: none"> Describe location of gluteal region. Discuss about bones and ligaments of the gluteal region. Discuss muscles of the gluteal region & their respective actions. Discuss nerves and blood vessels of the gluteal region. 	MSK-S1-Ana-G-28 The Gluteal region	Demonstration	SBQs, OSPE & OSVE
77	<ul style="list-style-type: none"> Describe the articular surfaces of the hip joint along with the capsular attachment Enumerate ligaments of the hip joint & describe their attachments. Discuss clinical correlates 	MSK-S1-Ana-G-29 Hip joint	Interactive Lecture	SBQs & OSVE
78	<ul style="list-style-type: none"> Identify different types of cartilage under a light Microscope. Define distinctive microscopic features of each type. 	MSK-S1-Ana-H-5 Histology of Hyaline Cartilage	Practical	OSPE & OSVE
Physiology				
79	<ul style="list-style-type: none"> Describe role of skin in homeostasis Describe the function of skin Describe medico-legal importance of the skin 	MSK-S1-Phy-12 Physiology of Skin	Interactive Lecture	SBQs & OSVE
Biochemistry				
80	<ul style="list-style-type: none"> Describe the metabolic pathway for the synthesis of purines and pyrimidines 	MSK-S1-Bio-15 Metabolic pathway for the synthesis of purines and pyrimidines	Interactive Lecture	SBQs & OSVE
81	<ul style="list-style-type: none"> Discuss in detail the metabolic pathways for nucleic acid degradation. Inherited associated disorders. Uric acid metabolic disorders. 	MSK-S1-Bio-16 Metabolic pathways for nucleic acid degradation and related disorders.		

82	<ul style="list-style-type: none"> Demonstrate the methods to estimate the serum uric acid. 	MSK-S1-Bio-17 Estimation of serum uric acid	Practical	OSPE & OSVE
Pathology				
84	<ul style="list-style-type: none"> Mention types of arthritis Define Osteoarthritis & Rheumatoid arthritis Describe their clinical features 	MSK-S1-Path-2 Arthritis	Interactive Lecture	SBQs & OSVE
Clinical Lecture				
85	Explain clinical manifestations of arthritis	MSK-S1-Ortho-3 Clinical manifestation of Arthritis	Interactive Lecture	SBQs & OSVE

Theme 7: Anterior Compartment of Leg and Compartment Syndrome				
S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
86	<ul style="list-style-type: none"> Describe muscles of posterior compartment of thigh. Describe arterial supply of posterior compartment of thigh. Discuss trochanteric and cruciate anastomosis at back of thigh. Describe venous drainage of this region. 	MSK-S1-Ana-G-30 Post: compartment of thigh + popliteal fossa	Demonstration	SBQs, OSPE & OSVE
87	<ul style="list-style-type: none"> Describe anatomical position of the bone. Identify the bone and its side determination. Mark attachment of muscles and ligaments. Describe the nerve injuries related to it. 	MSK-S1-Ana-G-31 Tibia & fibula		
88	<ul style="list-style-type: none"> Discuss site and time of appearance of upper and lower limb buds. Define source of mesoderm forming the limb muscles 	MSK-S1-Ana-E-6 Development of Limbs & its clinical 1	Interactive Lecture	SBQs & OSVE

89	<ul style="list-style-type: none"> Discuss the formation of different compartments of leg. Explain the arrangement of the muscles in the anterior compartments of leg and their actions. Describe the neurovasculature of these compartments of leg. Identify bones forming the architecture of the foot. Discuss joints formed by these bones. 	MSK-S1-Ana-G-32 Anterior compartment of leg & dorsum of foot	Demonstration	SBQs, OSPE & OSVE
90	<ul style="list-style-type: none"> Explain the arrangement of the muscles in the lateral compartments of the leg and their actions. Describe the microvasculature of these compartments of the leg Clinical correlates like compartment syndrome of the leg. 	MSK-S1-Ana-G-33 Lateral compartment of the leg & tibiofibular joint		
91	<ul style="list-style-type: none"> Describe the articular surfaces of the knee joint along with the capsular attachment. Describe ligaments & bursa of the knee joint and discuss their attachments. Describe movements of the knee joint. (locking & unlocking mechanism) 	MSK-S1-Ana-G-34 Knee joint	Interactive Lecture	SBQs & OSVE
92	<ul style="list-style-type: none"> Identify different types of cartilage under a light Microscope. Define distinctive microscopic features of each type. 	MSK-S1-Histo-6 Histology of elastic and fibrous cartilage	Practical	OSPE & OSVE
Biochemistry				
93	<ul style="list-style-type: none"> Demonstrate principals and types of chromatography. Interpretation of clinical conditions and investigations related to use in chromatography. 	MSK-S1-Bio-18 Chromatography	Practical	OSPE & OSVE

Theme 8: Posterior compartment of leg and foot

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				

96	<ul style="list-style-type: none"> • Explain the arrangement of the muscles in the posterior compartment of the leg. • Describe the nerve supply of these muscles. • Explain the actions of the muscles of the posterior compartment. • Discuss clinical correlates. 	MSK-S1-Ana-G-35 Posterior compartment of the leg	Demonstration	SBQs, OSPE & OSVE
97	<ul style="list-style-type: none"> • Describe the architecture of the arches of the foot and the factors responsible for their maintenance. • Identify the bones forming these arches. • Describe the function of the arches of foot. 	MSK-S1-Ana-G-36 Skeleton of foot & arches of foot		
98	<ul style="list-style-type: none"> • Discuss the hand plate and formation of digital rays resulting into digits 	MSK-S1-Ana-E-7 Development of Limbs & its clinical 2	Interactive Lecture	SBQs & OSVE

	<ul style="list-style-type: none"> • Describe the muscles involved in and process of rotation of the limb • Explain the congenital anomalies of the limbs 			
99	<ul style="list-style-type: none"> • Describe the Ankle Joint. • Describe Superior and Inferior Tibiofibular Joints. 	MSK-S1-Ana-G-37 Ankle, subtalar & small joints of foot	Demonstration	SBQs, OSPE & OSVE
100	<ul style="list-style-type: none"> • Identify the bones forming the architecture of the sole. • Discuss the joints formed by these bones. • Describe clinical correlates like flat foot and club foot. 	MSK-S1-Ana-G-38 Sole		
101	<ul style="list-style-type: none"> • Explain the different nerves of the lower limb and their root value. • Discuss causes of injuries. • Enumerate common sites of these nerve injuries • Discuss symptoms caused by these nerve injuries. 	MSK-S1-Ana-G-39 Neurovascular bundle of the lower limb		
102	<ul style="list-style-type: none"> • Discuss the blood supply and nerve supply of the sole. • Describe the vascular and nervous supply of the dorsum of foot. 	MSK-S1-Ana-G-40 Neurovascular bundle of the foot		

103	<ul style="list-style-type: none"> Describe the development of the musculoskeletal system. Discuss the development of Myotomes List derivatives of epaxial and hypaxial divisions of myotomes Describe the development of bones, joints & cartilage 	MSK-S1-Ana-E-8 Overview of Embryological development of the musculoskeletal system	Interactive Lecture	SBQs & OSVE
104	<ul style="list-style-type: none"> Describe layers of the skin. Discuss layers of the Epidermis. Describe appendages of skin. Discuss the functions of the skin. 	MSK-S1-Ana-H-7 Microscopic Anatomy of the Skin		
105	<ul style="list-style-type: none"> Identify three layers of skin under the light microscope Describe structural basis & elements of skin. Recognize the function and organization of connective tissue in skin 	MSK-S1-Ana-H-8 Histology of skin	Practical	OSPE & OSVE

106	<ul style="list-style-type: none"> Identify three layers of skin under the light microscope Describe structural basis & elements of skin. Recognize the function and organization of connective tissue in skin 	MSK-S1-Ana-H-9 Histology of skin appendages		
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Clinical Interactive Lecture

109	<ul style="list-style-type: none"> Define terms related to fracture: Stress Fracture, Incomplete fracture, Closed (simple fracture), Open (complicated) fracture, multi-fragmented fractures, complex fracture, Pathologic fractures Describe the mechanism of bone healing Enlist complications of fracture Describe etiology & Pathogenesis of pathological fractures. 	MSK-S1-Ortho-4 Fractures/Dislocations	Interactive Lecture	SBQs & OSVE
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Pathology

110	<ul style="list-style-type: none"> • Classify different types of osteomyelitis • List factors leading to their etiology • Explain its pathogenesis 	MSK-S1-Path-3 Osteomyelitis	Interactive Lecture	SBQs & OSVE
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CARDIOVASCULAR MODULE-1

Introduction Welcome to the cardiovascular abnormalities' module. This exciting module will be very necessary to your future work as doctors. This module is designed to make your learning both interesting and productive by including interactive activities.

During this module, students will be encouraged to learn the structure and function of the cardiovascular system in an integrated manner, i.e. subjects such as Anatomy, Physiology and Biochemistry, will be learned and assessed together (Horizontal Integration). We will also help you learn the basic sciences in a way that is relevant to their clinical applications (Vertical Integration). By adopting this approach, we are preparing you better for your future work as doctor, where patients will come to you with problems that are not categorized by discipline name.

In order to help you learn in an integrated manner, we have updated the learning of basic sciences around a few key health-related situations (real life situations), which you are likely to encounter as first year medical students. You will be expected to think about the scenarios and participate in case based learning sessions for clearing your concepts and better learning. It will also help you focus your attention on what you need to achieve from the Interactive Lectures, practical and tutorials that have been scheduled during this module.

Rationale An overall aim of this module is to help you form a cognitive base for understanding pathogenesis of cardiovascular diseases as they are major cause of morbidity and mortality. (Cardiovascular diseases module – Third year) & practice of cardiovascular medicine (final-year clinical rotation). The module will prepare you for your future work in the medical course that will include learning in relation to the assessment and promotion of cardiovascular health and management of range of cardiovascular diseases.

Duration 5 weeks

Learning Outcomes By the end of this foundation module, the students should be able to: **Knowledge:** At the end of this module, the students will be able to:

- Describe the components of the cardiovascular system by learning and applying the relevant basic sciences.
- Apply the above knowledge to a few common real-life situations (Hypertension, Myocardial Infarction and Shock) to explain how the anatomy, Physiology and Biochemistry are altered in the given situation.
- Describe the anatomy of the different parts of the cardiovascular system in detail.
- Describe the development and anomalies of the cardiovascular system.
- Define and identify the microscopic features of the cardiovascular system.
- Describe the functions of the cardiovascular system.
- Interpret the Biochemical changes in the body related to the cardiovascular system.
- Enlist pathologies involving cardiovascular system.
- Describe the management of cardiovascular diseases.
- Perform the cardiovascular system examination.
- Take the history of the patients and correlate the cardiovascular signs & symptoms to reach the differential diagnosis
- To counsel the people in the community regarding the risk factors of cardiac diseases.

Clinical/ Practical skills

Measuring blood pressure using a Sphygmomanometer with correct technique and interpretation of its values, and calculation of mean arterial pressure. Identification of areas on the chest for auscultation of the heart sounds. Placing electrodes and obtaining an electrocardiogram, and interpretation of the basic ECG findings. Identification of cardiac tissues and blood vessels under the microscope with points of Identification. (Students are required to draw and label microscopic sections of cardiovascular components in a histology journal. The journal will be assessed during the end-module examination. Perform clinical examination of the cardiovascular system.

Attitude:

Follow the basic laboratory protocols.

Participate in class and practical work professionally. Communicate effectively in a team with peers, staff, and teachers.

Demonstrate professionalism and ethical values in dealing with patients, peers, staff, and teachers.

Demonstrate the ability to reflect on the performance.

Themes

Theme 1: Arrhythmias and Myocardial Infarction

Theme 2: Congenital Anomalies of the Cardiovascular System

Theme 3: Hypertension

Theme 4: Heart Failure

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES				
Theme 1: Arrhythmias, Myocardial Infarction				
S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
1	<ul style="list-style-type: none"> Define the middle mediastinum. Explain the location and contents of the middle mediastinum. Discuss fibrous and serous parts of the pericardium. Define pericardial sinuses and nerve supply of the pericardium. Discuss related clinical conditions. 	CVS-S1-Ana-G-1 Middle Mediastinum and The Pericardium	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> Define the Anatomical position of the heart. Identify and name structures constituting the borders and surfaces of the heart. Define the external features of the Chambers of the heart. 	CVS-S1-Ana-G-2 Anatomy of the Heart-1	Demonstration	SBQs, OSPE & OSVE
3	<ul style="list-style-type: none"> Describe the Internal features of each chamber of the heart. Discuss the related clinical conditions. 	CVS-S1-Ana-G-3 Anatomy of the Heart-2		

4	<ul style="list-style-type: none"> Describe composition of the walls and the skeleton of the heart. Describe conducting system of the heart. Discuss related clinical conditions. 	CVS-S1-Ana-G-4 Structure of the heart and The Conducting system of the Heart		
5	Identify the histological features of the heart: endocardium, myocardium, and epicardium on the light microscope.	CVS-S1-Ana-H-1 Histology of the Heart	Practical	OSPE & OSVE
Physiology				
6	<ul style="list-style-type: none"> Describe components/parts of CVS and their functions Define systemic and pulmonary circulation Mention the distribution of blood (in percentage of total blood) in different parts of the circulatory system Mention pressures in various portions of the circulatory system 	CVS-S1-Phy-1 Overview of CVS	Interactive Lecture	SBQs & OSVE
7	<ul style="list-style-type: none"> Mention three major types of muscle Describe properties of cardiac muscle (Functional syncytium, Automaticity, Rhythmicity, Conductivity, Long refractory period) Describe cardiac muscle action potential Discuss the mechanism of excitation-contraction coupling in cardiac muscle 	CVS-S1-Phy-2 Properties of cardiac muscle	Interactive Lecture	SBQs & OSVE
08	<ul style="list-style-type: none"> Describe various parts/components of the conducting system of the heart and their functions Explain the action potential and the rhythmicity of sinus nodal fibers Describe the origin and spread of the cardiac impulse Mention AV nodal delay and its significance Describe the effect of the ANS on the functioning of the conducting system of the heart 	CVS-S1-Phy-3 Excitatory and Conducting system of the heart	Interactive Lecture	SBQs & OSVE
09	<ul style="list-style-type: none"> Define electrocardiogram and electrocardiography Describe the waves, intervals and segments of a normal electrocardiogram (ECG) Mention the uses/indications of ECG 	CVS-S1-Phy-4 Electrocardiogram (ECG)		
Biochemistry				
10	<ul style="list-style-type: none"> Mention the introduction of isoenzymes Discuss the diagnostic significance of isoenzymes 	CVS-S1-Bio-1 Diagnostic significance of Isoenzymes in cardiovascular disorders	Interactive Lecture	SBQs & OSVE
Pathology				

11	<ul style="list-style-type: none"> Define ischemic heart disease? Classify different types of ischemic heart diseases. Discuss causes and clinical manifestations of ischemic heart diseases. 	CVS-S1-Path-1 Ischemic heart disease	Interactive Lecture	SBQs & OSVE
Medicine (Cardiology)				
12	<ul style="list-style-type: none"> Define Arrhythmias Recognize the common abnormalities in rate and rhythm of the heart (tachycardia, bradycardia, flutter, fibrillation, heart blocks and extra systole) failure. Describe the hemodynamic, neuroendocrine and cellular changes that occur in heart failure. Describe the Physiological basis of the treatment principles in heart failure. 	CVS-S1-Cardio-1 Arrhythmias	Interactive Lecture	SBQs & OSVE

Theme 2: Congenital Anomalies of the Cardiovascular System				
S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
13	<ul style="list-style-type: none"> Describe the development of the cardiogenic field and heart tube. Enumerate the derivatives of the heart tube. Define the formation of cardiac looping and dextrocardia, and how the sinus venous and cardiac septa formed. 	CVS-S1-Ana-E-1 Development of the heart tube	Interactive Lecture	SBQs & OSVE
14	<ul style="list-style-type: none"> Explain atrial and interatrial septum development. Explain ventricles and Inter-ventricular septum development. Enlist common congenital anomalies of heart chambers. 	CVS-S1-Ana-E-2 Development of the heart chambers and their septa -1		
15	<ul style="list-style-type: none"> Explain How atria and interatrial septum develops? How ventricles and Inter-ventricular septum develop? What are the common congenital anomalies of heart chambers? 	CVS-S1-Ana-E-3 Development of the heart chambers and their septa -2		
16	<ul style="list-style-type: none"> Describe septa formation in bulbus cordis and the truncus arteriosus. Enlist congenital heart defects; transposition of great vessels, PDA, PTA 	CVS-S1-Ana-E-4 Development of septa in the truncus arteriosus, valves, and conducting system		
17	<ul style="list-style-type: none"> Describe the microscopic features of the arteries Identify the different types of arteries 	CVS-S1-Ana-H-2 Histology of the Arteries		

Physiology				
18	<ul style="list-style-type: none"> Define cardiac cycle Mention duration of cardiac cycle and its relation with heart rate Describe sequence of events of cardiac cycle Mention pressure changes that occur during each cardiac cycle 	CVS-S1-Phy-5 Cardiac cycle and its mechanical Events-I	Interactive Lecture	SBQs & OSVE
19	<ul style="list-style-type: none"> Describe the relationship of the electrocardiogram to mechanical events of cardiac cycle Mention pressure changes in atria Define J V P and mention its clinical importance 	CVS-S1-Phy-6 Cardiac cycle and its mechanical events-II		
	<ul style="list-style-type: none"> Define EDV, ESV and Stroke volume Define ejection fraction and mention its clinical importance Define preload and afterload 			
20	<ul style="list-style-type: none"> Describe functions of heart valves Mention normal heart sounds and explain their production Define heart murmur Mention the timing of the murmur produced by valvular defects and congenital heart diseases Explain the hemodynamic changes in various valvular heart diseases 	CVS-S1-Phy-7 Heart valves, heart sounds and murmurs		
21	<ul style="list-style-type: none"> Define Ohm's law of circulation Describe main factors that determine vascular resistance Define total peripheral vascular resistance and total pulmonary vascular resistance Mention Poiseuille's law 	CVS-S1-Phy-8 Interrelationship among blood flow, pressure and resistance		
Biochemistry				
22	<ul style="list-style-type: none"> Describe different aspects related to fatty acids and their clinical significance in the CVS diseases. 	CVS-S1-Bio-2 Fatty acids	Interactive Lecture	SBQs & OSVE
Pathology				
23	<ul style="list-style-type: none"> Define aneurysm Classification of aneurysm What are the true and false aneurysms with their examples Pathogenesis of aneurysm 	CVS-S1-Path-2 Congenital anomalies of blood vessels	Interactive Lecture	SBQs & OSVE
24	<ul style="list-style-type: none"> Define congenital heart disease. Describe etiopathogenesis. Discuss clinical features 	CVS-S1-Path-3 Congenital heart disease.		
Pediatrics				

25	<ul style="list-style-type: none"> Describe the Hemodynamic changes in various congenital heart diseases including; Mitral Stenosis Mitral Regurgitation Stenosis Aortic regurgitation 	CVS-S1-Paeds-I Congenital heart diseases	Interactive Lecture	SBQs & OSVE
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Theme 3: Hypertension

S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
26	<ul style="list-style-type: none"> Describe the arterial supply and venous drainage of heart. Describe the branches of major arteries and their distribution. Define the nerve supply of the heart. Describe the cardiac plexus. 	CVS-S1-Ana-G-5 Blood and nerve supply of the Heart	Interactive Lecture	SBQs & OSVE
27	<ul style="list-style-type: none"> Discuss development of arterial system; aortic arches, umbilical, vitelline and coronary arteries Name the common congenital anomalies of arteries? 	CVS-S1-Ana-E-5 Development of arterial system of heart		
28	<ul style="list-style-type: none"> Discuss the development of the venous system, cardinal veins, umbilical, and vitelline. Name the common congenital anomalies of the venous system? 	CVS-S1-Ana-E-6 Development of the venous system of heart		
29	Describe the microscopic structure of the veins	CVS-S1-Ana-H-3 Histology of veins	Practical	OSPE & OSVE
Physiology				
30	<ul style="list-style-type: none"> Mention the specific needs of the tissues for blood flow Define local blood flow Describe acute/short-term control of local blood flow Describe long-term control of local blood flow Explain the auto-regulation of blood flow 	CVS-S1-Phy-9 Control of local blood flow		

31	<ul style="list-style-type: none"> Describe the structure of microcirculation and capillary wall Explain flow of blood in capillaries Define vasomotion Define Starling forces and give their approximate values Describe role of Starling forces in fluid exchange across the capillary wall List the functions of lymphatics Define edema and explain the patho Physiological basis for edema (i.e. increased capillary hydrostatic pressure, hypoalbuminemia, increased capillary permeability and lymphatic obstruction) 	CVS-S1-Phy-10 Capillary fluid exchange	Practical	OSPE & OSVE
32	<ul style="list-style-type: none"> Describe the vasomotor center, its important areas, and functions Define vasomotor tone Describe the role of the sympathetic nervous system in the regulation of circulation Describe the role of the parasympathetic nervous system in the regulation of circulation 	CVS-S1-Phy-11 Nervous regulation of circulation		
33	<ul style="list-style-type: none"> Define systolic blood pressure, diastolic blood pressure, pulse pressure and mean arterial pressure Mention important factors on which blood pressure depends List various mechanisms that regulate/control blood pressure Describe role of baroreceptor reflex in regulation of blood pressure 	CVS-S1-Phy-12 Blood pressure and its Regulation-I (Baroreceptor reflex mechanism)		
Biochemistry				
34	Explain the metabolism and function of	CVS-S1-Bio-3 Cholesterol	Interactive Lecture	SBQs & OSVE
	Cholesterol and its clinical significance in CVS diseases			
35	Describe the prostaglandins & leukotriens, their synthesis and general functions.	CVS-S1-Bio-4 Prostaglandins and Leukotriens		
36	Demonstrate the estimation of the serum cholesterol	CVS-S1-Bio-P1 Serum Cholesterol estimation	Practical	OSPE & OSVE
Pharmacology				
37	To describe the drugs used in CVS	CVS-S1-Pharm-1 Introduction to drugs used in CVS	Interactive Lecture	SBQs & OSVE

Medicine (Cardiology)				
38	<ul style="list-style-type: none"> Define hypertension. List the causes of hypertension. Describe the pathogenesis of hypertension. Explain the compensatory measures that maintain the blood pressure on rising from supine positions. Explain the Physiological basis of the treatment principles in hypertension 	CVS-S1-Cardio-2 Hypertension	Interactive Lecture	SBQs & OSVE

Theme 4: Heart Attack				
S. #	LEARNINGOBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
39	<ul style="list-style-type: none"> Identify different chambers/structures of the heart. 	CVS-S1-Ana-G-6 Model study of heart	Demonstrati on	SBQs & OSPE & OSVE
40	<ul style="list-style-type: none"> Identify different chambers/structures of the heart. 	CVS-S1-Ana-G-7 Model study of heart		
41	<ul style="list-style-type: none"> Describe circulatory changes before and after birth. Name the adult derivatives of embryonic structures? 	CVS-S1-Ana-E-7 Circulation before and after birth	Interactive Lecture	SBQs & OSVE
42	Identify the capillaries with the help of light microscope.	CVS-S1-Ana-H-4 Histology of capillaries	Practical	OSPE & OSVE
Physiology				
43	<ul style="list-style-type: none"> Explain renal-body fluid system and its role in arterial pressure control Describe Renin-Angiotensin system and its role in arterial pressure control 	CVS-S1-Phy-13 Blood pressure and its regulation-II (Role of kidneys in long-term control of blood pressure)	Interactive Lecture	SBQs & OSVE
44	<ul style="list-style-type: none"> Define cardiac output and mention its relationship to stroke volume & heart rate Describe factors regulating cardiac output Describe Frank-Starling mechanism of heart 	CVS-S1-Phy-14 Cardiac output and venous return		
45	<ul style="list-style-type: none"> Mention some pathological conditions that cause high cardiac output Mention some pathological conditions that cause low cardiac output Mention the methods of measurement of cardiac output 	CVS-S1-Phy-15 Cardiac output and venous return		

	<ul style="list-style-type: none"> Define venous return and mention factors that affect/regulate venous return Describe central venous pressure 			
46	<ul style="list-style-type: none"> Define circulatory shock Describe causes and major types of shock Mention stages of shock Describe the Physiology of non-progressive and progressive hemorrhagic shock 	CVS-S1-Phy-16 Circulatory shock		
47	<ul style="list-style-type: none"> Mention compensatory mechanisms that attempt to return cardiac output and arterial pressure to normal in a hemorrhagic shock (hypovolemic shock) Mention factors that lead to progression of shock (i.e. factors worsening the shock) Describe the Physiological basis of treatment of circulatory shock 	CVS-S1-Phy-17 Circulatory shock		
48	<ul style="list-style-type: none"> To record pulse rate manually & on the PowerLab To record blood pressure manually & on the PowerLab To record ECG on ECG machine & power lab To auscultate heart sounds 	CVS-S1-Phy-18 Pulse rate, blood pressure, and ECG recording on power lab. and ECG machine	Practical	OSPE & OSVE
Biochemistry				
49	Discuss lipoproteins' metabolism and their clinical significance in CVS diseases	CVS-S1-Bio-5 Lipoproteins	Interactive Lecture	SBQs & OSVE
50	Interpret lipid profile and its significance	CVS-S1-Bio-P2 Lipid Profile	Practical	OSPE & OSVE
Pathology				
51	<ul style="list-style-type: none"> Define shock Enlist types of shock Describe causes, patho-physiology, signs and symptoms of shock 	CVS-S1-Path-4 Shock	Interactive Lecture	SBQs & OSVE
Medicine (Cardiology)				
52	<ul style="list-style-type: none"> Define heart failure. Explain the Physiological basis of common clinical manifestations of heart failure. Describe different types of heart failure. Describe hemodynamic, neuroendocrine, and cellular changes that occur in heart failure. Describe the Physiological basis of treatment principles in heart failure. 	CVS-S1-Cardio-3 Heart failure	Interactive Lecture	SBQs & OSVE

RESPIRATORY MODULE 1

Introduction This exciting module will serve as building block and is very essential to your future work as doctors. This module is designed to make your learning both interesting and productive by including several interactive activities. An understanding of the structure of the chest wall and the diaphragm is essential if one has to understand the normal movements of the chest wall. Contained within the protective thoracic cage are the important life sustaining organs, such as lungs, Heart and the major blood vessels. Although the chest wall is strong, blunt or penetrating wounds can injure the soft organs. Flail chest (stove-in chest) is an extremely painful injury and impairs ventilation, thereby affecting oxygenation of the blood. This module will explain the Patho-Physiology of all the related conditions.

Rationale There is a high prevalence of respiratory diseases in our community which may leads to increased morbidity and mortality. A practitioner can only be able to deal with the patients suffering from the respiratory diseases when he/she has the basic concepts regarding the structural and functional knowledge of respiratory system. Acute respiratory infections, like pneumonia are critical for children, older adults and people with immune system disorders. For the management certain respiratory diseases, oxygen administration and artificial ventilation are required, hence it is better to explain the students on these topics in earlier years. Smoking is high risk factor for the development of COPD and lung cancer; therefore, its Patho-Physiology is important to learn. Respiratory module is designed in such a way that a student can understand structure, functions, pathogenesis, prescriptions including drug prescription and can educate the community regarding prevention of diseases and promotion of health.

Duration 5 weeks

Learning Outcomes

Knowledge: At the end of this module, the students will be able to:

- Describe the development and anomalies of the respiratory system.
- Define and identify the microscopic features of the respiratory system
- Describe the anatomy of the different parts of the respiratory system in detail
- Describe the functions of the respiratory system
- Interpret the Biochemical changes in the body related to the respiratory system
- Explain obstructive and restrictive pathologies involving respiratory system
- Describe the management of respiratory diseases
- Perform the respiratory system examination
- Take the history of the patients and co-relate the respiratory sign & symptoms to reach the differential diagnosis
- To counsel the people in community regarding the risk factors of the respiratory diseases.

Skills

- Microscopic identification of the different parts of the respiratory system.
- Perform the spirometry & plot a graph of lung volume
- Perform the cardiopulmonary resuscitation(CPR)
- Analysis of general properties of lipids
- Application of pH meter
- Interpretation of ABGs, PFT
- Perform clinical examination of the respiratory system

Attitude

- Follow the basic laboratory protocols
- Participate in class and practical work professionally

- Communicate effectively in a team with peers, staff and teachers
- Demonstrate professionalism and ethical values in dealing with patients, cadavers, peers, staff and teachers.
- Communicate effectively in a team with peers and teachers.
- Demonstrate the ability to reflect on the performance.

Themes

Theme 1: The Chest / Thoracic wall and trauma

Theme 2: Airways and their conditions or diseases

Theme 3: Lung parenchyma & interstitium and the related diseases

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES				
Theme 1: The Chest/ Thoracic Wall and Trauma				
S #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
1	cation of the respiratory system. thoracic cage & wall. <ul style="list-style-type: none"> • Define thoracic inlet & thoracic outlet. • Discuss thoracic outlet syndrome. 	RESP-S1-Ana-G-1 General introduction of the Respiratory system and Anatomy of the thorax	Interactive Lecture	SBQs & OSVE
2	<ul style="list-style-type: none"> • Define general features of the sternum. • Define general features of the ribs. • Differentiate typical and atypical ribs. • Define costal cartilages. • Discuss attachment of various muscles. 	RESP-S1-Ana-G-2 Osteology of the Ribs and the Sternum	Demonstration	SBQs, OSPE & OSVE
3	<ul style="list-style-type: none"> • Define general features of the thoracic vertebra. • Differentiate typical and atypical thoracic vertebrae. • Discuss joints of the thoracic walls. 	RESP-S1-Ana-G-3 Osteology of the thoracic vertebrae		
4	<ul style="list-style-type: none"> • Define three morphological layers of the muscles of the thoracic wall. • Define intercostal spaces. • Define the endothoracic fascia. • Discuss supra supra-pleural membrane. 	RESP-S1-Ana-G-4 Muscles of the thoracic wall and intercostal spaces		

5	<ul style="list-style-type: none"> Define intraembryonic mesoderm and its parts. Discuss divisions of lateral plate mesoderm into visceral and parietal layers. Define extent of the intraembryonic coelom and its divisions. Discuss formation of the pleuro-pericardial and pleuro-peritoneal membranes. 	RESP-S1-Ana-E-1 Formation of the intraembryonic cavity, Serous membranes and thoracic cavity	Interactive Lecture	SBQs & OSVE
6	<ul style="list-style-type: none"> Discuss the steps of the development of diaphragm from its composite embryonic derivatives. Discuss anomalies related to its development 	RESP-S1-Ana-E-2 Development of the diaphragm		

7	<ul style="list-style-type: none"> Describe histological features of different layers of the Trachea. Identify tracheal epithelium and other microscopic features of the trachea with the help of a light microscope. 	RESP-S1-Ana-H-1 Histology of the Trachea	Practical	OSPE & OSVE
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Physiology

8	<ul style="list-style-type: none"> Describe an overview of respiration Describe parts and functions of the respiratory tract Define pulmonary ventilation 	RESP-S1-Phy-1 Overview of the respiratory tract, functions	Interactive Lecture	SBQs & OSVE
9	<ul style="list-style-type: none"> Describe the mechanics of pulmonary ventilation and muscles of respiration Describe changes in the lung volume, alveolar pressure, pleural pressure & Transpulmonary pressure & its changes during respiration. Discuss alveolar ventilation & dead space also describe cough & sneezing reflexes 	RESP-S1-Phy-2 The mechanics of breathing		
10	<ul style="list-style-type: none"> Define lung compliance & list factors affecting lung compliance Describe composition & role of surfactant in maintaining alveolar stability & infant respiratory distress syndrome Differentiate compliance work, tissue resistance work & airway resistance work 	RESP-S1-Phy-3 Lung compliance & work of breathing and surfactant		
11	<ul style="list-style-type: none"> Define pulmonary volumes & capacities with their normal values & significance in pulmonary function tests. Discuss alveolar ventilation & dead space 	RESP-S1-Phy-4 Lung volumes & capacities		

12	<ul style="list-style-type: none"> Record the effect of respiration during sitting & standing of a young adult on the power lab & plot a graph. Record the effect of swallowing & deglutition on respiration in healthy adult on power lab & plot a graph 	RESP-S1-Phy-5 Respiratory adaptations during standing, sitting, and swallowing in the power lab	Practical	OSPE & OSVE
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Biochemistry

13	<ul style="list-style-type: none"> Concept of pH, Buffers & their mechanism of action, Types of Buffers in humans 	RESP-S1-Bio-1 Concept of pH, Buffers & their mechanism of action, Types of Buffers in humans	Interactive Lecture	SBQs & OSVE
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14	<ul style="list-style-type: none"> Describe the acid base balance. Explain the respiratory and metabolic acidosis & alkalosis with causes and compensatory mechanisms. 	RESP-S1-Bio-2 Acid Base Balance/ Metabolic & Respiratory Acidosis & Alkalosis		
15	<ul style="list-style-type: none"> Description & Biomedical significance of Compound Lipids 	RESP-S1-Bio-3 Biomedical significance of Compound Lipids		
16	<ul style="list-style-type: none"> Describe the Synthesis & Functions of Phospholipids. Discuss role of lecithin in respiration 	RESP-S1-Bio-4 Synthesis of Phospholipids & Role Of Lecithin in Respiration		
17	Demonstrate the pH Meter, Significance, interpretation	RESP-S1-Bio-5 Introduction to pH Meter, Significance, interpretation	Practical	OSPE & OSVE

Pathology

18	<ul style="list-style-type: none"> Identify congenital anomalies of lungs. Define acute lung injury Describe causes of ARDS. Discuss characteristic features, morphology and pathogenesis of ARDS. Describe its consequences and clinical course. 	RESP-S1-Patho-1 Congenital anomalies, acute lung injury and ARDS	Practical	OSPE & OSVE
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CLINICAL CLASSES

20	<ul style="list-style-type: none"> Define Chyne-stokes breathing and its effects on body. Define COPD and RLD. Differentiate between RLD & COLD & effects on body (obstructive & restrictive lung disease). Is COVID-19 RLD or COLD type of disease Define emphysema, chronic bronchitis. Define Bronchiectasis. Define interstitial lung diseases 	RESP-S1-MED-1 Obstructive and Restrictive Lung Diseases	Interactive Lecture	SBQs & OSVE
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Theme 2: Airways and Their Conditions or Diseases

S #	LEARNING OBJECTIVES	TOPICS	TEACHING STRATEGY	ASSESSMENT
Anatomy				
21	<ul style="list-style-type: none"> Discuss attachments of the diaphragm. Define blood and nerve supply of the diaphragm. Identify openings in the diaphragm with levels. Define structures passing through these openings. Define functions of the diaphragm. 	RESP-S1-Ana-G-5 The Diaphragm and its Openings	Demonstration	SBQs, OSPE & OSVE

22	<ul style="list-style-type: none"> Describe mediastinum Describe boundaries and divisions of the mediastinum Enumerate structures present in it 	RESP-S1-Ana-G-6 Mediastinum	Interactive Lecture	SBQs & OSVE
23	<ul style="list-style-type: none"> Define the anatomy of the trachea. Discuss clinical conditions related to the trachea. 	RESP-S1-Ana-G-7 Anatomy of the trachea		
24	<ul style="list-style-type: none"> Define the anatomy of the principal bronchi. Discuss clinical conditions related to bronchi. 	RESP-S1-Ana-G-8 Anatomy of the bronchi	Demonstration	SBQs, OSPE & OSVE
25	<ul style="list-style-type: none"> Describe the development of the larynx, trachea, and bronchi. Discuss anomalies related to the development of these structures. 	RESP-S1-Ana-E-3 Formation of the Larynx, Trachea, and Bronchi	Interactive Lecture	SBQs & OSVE

26	<ul style="list-style-type: none"> Describe microscopic features of the bronchi. Differentiate primary bronchioles from the tertiary bronchioles. Identify general histological features of bronchi and bronchioles with the help of a light microscope. 	RESP-S1-Ana-H-2 The Histology of the Bronchi: Primary and Tertiary Bronchioles	Practical	OSPE & OSVE
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Physiology

27	<ul style="list-style-type: none"> Describe the structure & functions of the Respiratory membrane Gas exchange across the respiratory membrane Factors affecting exchange through membrane 	RESP-S1-Phy-6 Diffusion of Gases	Interactive Lecture	SBQs & OSVE
28	<ul style="list-style-type: none"> Describe transport of oxygen in the blood. Discuss the oxygen Hb dissociation curve & factors affecting it 	RESP-S1-Phy-7 Transport of oxygen		
29	<ul style="list-style-type: none"> Describe transport of CO₂ in the blood & gasses exchange between blood & body cells (chloride shift) 	RESP-S1-Phy-8 Transport of CO ₂		
30	<ul style="list-style-type: none"> Enlist respiratory centers Describe mechanisms of nervous regulation of respiration Describe reflexes involved in nervous regulation 	RESP-S1-Phy-9 Nervous regulation of respiration		
31	<ul style="list-style-type: none"> Record the effect of exercise on respiration in healthy adult on power lab & plot a graph Interpret Pulmonary Function Tests 	RESP-S1-Phy-10 Record the lung volumes and capacities on power lab & plot a graph	Practical	OSPE & OSVE

Biochemistry

32	Describe the Glycolysis in detail.	RESP-S1-Bio-6 Glycolysis	Interactive Lecture	SBQs & OSVE
33	Describe the role of the TCA Cycle in cellular respiration	RESP-S1-Bio-7 Role of TCA Cycle in cellular respiration		
34	<ul style="list-style-type: none"> Demonstrate the Arterial blood gases significance Describe the ABG's interpretation with various respiratory disorders 	RESP-S1-Bio-8 Arterial blood gases (ABGs) interpretation	Practical	OSPE & OSVE

Pathology

35	<ul style="list-style-type: none"> Define chronic obstructive lung disease (COPD) Classify the types of COPD Describe its pathogenesis & clinical features. 	RESP-S1-Path-2 Chronic obstructive lung diseases (COPD)	Interactive Lecture	SBQs & OSVE
Pharmacology				
36	<ul style="list-style-type: none"> Classify drugs used to treat dry and productive cough according to their mechanism of action. Describe adverse effects, contraindications, and drug interactions of the drugs used to treat various types of cough. 	RESP-S1-Pharm-1 The Anti-Tussive Drugs	Interactive Lecture	SBQs & OSVE
Clinical Classes				
37	<ul style="list-style-type: none"> Define hypoxia and its types. Explain effects of the hypoxia. Explain psychogenic dyspnea & causes of psychogenic dyspnea Define cyanosis. Explain prevention strategies of cyanosis. Enlist three principal reasons of cyanosis. Define CO2 poisoning. Explain the effects of CO2 poisoning and preventing measures of CO2. 	RESP-S1-MED-2 Hypoxia Cyanosis CO2 poisoning	Interactive Lecture	SBQs & OSVE

Theme 3: Lung Parenchyma and Interstitium and their Conditions or Diseases

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY	ASSESSMENT
Anatomy				
38	Define structure and nerve supply of pleura	RESP-S1-Ana-G-9 Anatomy of the pleurae	Demonstration	SBQs, OSPE & OSVE
39	<ul style="list-style-type: none"> Describe gross anatomy of the lungs. Discuss the phases of the respiration 	RESP-S1-Ana-G-10 Anatomy of the lungs Mechanism of the respiration-1		
40	<ul style="list-style-type: none"> Define bronchopulmonary segments. Define types of the respiration. Discuss clinical conditions related with lungs. 	RESP-S1-Ana-G-11 Anatomy of the lungs Mechanism of the respiration-2 (bronchopulmonary segment)		

41	<ul style="list-style-type: none"> Define blood and nerve supply of the lungs. Discuss clinical conditions related with lungs. 	RESP-S1-Ana-G-12 Anatomy of the lungs-3 (Blood supply)	Interactive Lecture	SBQs & OSVE
42	<ul style="list-style-type: none"> Define clinical significance of chest X- ray in respiratory diseases. 	RESP-S1-Ana-G-13 Radiology: Basics of chest X-ray		
43	<ul style="list-style-type: none"> Discuss formation of laryngo-tracheal groove & respiratory diverticulum or lung buds. Define anomalies related with development of the lung buds. Discuss stages of development / maturation of the lungs. Discuss anomalies related to the lung maturation 	RESP-S1-Ana-E-4 Formation of the lung buds The maturation of the Lungs		
44	<ul style="list-style-type: none"> Identify structure of the alveoli and inter-alveolar septum under the microscope and correlate functions of different types of cells, forming the alveolar wall. Identify structure and function of the blood air barrier 	RESP-S1-Ana-H-3 The Histology of the Lungs: Alveoli	Practical	OSPE & OSVE
Physiology				
45	<ul style="list-style-type: none"> Describe chemical control of respiration Explain chemoreceptor involved in chemical respiration. Describe regulation of respiration during exercise. Explain Periodic breathing 	RESP-S1-Phy-9 Chemical regulation of Respiration: Regulation during exercise	Interactive Lecture	SBQs & OSVE
46	<ul style="list-style-type: none"> Describe pulmonary circulation & blood flow through various zones of lung (1, 2, 3). Explain pulmonary capillary dynamics. Explain mechanism of development of pulmonary edema, pleural effusion Ventilation perfusion ratio (V/Q ratio) 	RESP-S1-Phy-10 Pulmonary Circulation & V/Q relationships		
47	<ul style="list-style-type: none"> Define respiratory changes associated with High altitude Discuss hypoxia and its types. 	RESP-S1-Phy-11 High altitude & Hypoxia		
48	<ul style="list-style-type: none"> Explain deep sea diving Physiology Describe caisson's disease 	RESP-S1-Phy-12 Deep sea Diving Physiology		

Biochemistry				
49	Describe the organization of the Electron Transport Chain	RESP-S1-Bio-9 Organization of the Electron Transport Chain	Interactive Lecture	SBQs & OSVE
50	Describe Oxidative phosphorylation & ATP Synthesis	RESP-S1-Bio-10 Oxidative Phosphorylation & ATP Synthesis		
51	Demonstrate the role of emulsification in respiration and digestion.	RESP-S1-Bio-11 Role of Emulsification in respiration and digestion	Practical	OSPE & OSVE
Pathology				
52	<ul style="list-style-type: none"> Define pneumonia. Discuss etiological classification of pneumonia. Discuss its clinical presentation. Describe diagnostic tools for pneumonia. 	RESP-S1-Path-3 Pneumonia	Interactive Lecture	SBQs & OSVE
Clinical				
53	<ul style="list-style-type: none"> Define RDS. Describe signs and symptoms of the respiratory distress syndrome. Enlist the causes of the respiratory distress syndrome Discuss the management 	RESP-S1-Med-3 Respiratory distress syndrome	Interactive Lecture	SBQs & OSVE

Introduction

Behavioral sciences (BS) is the scientific study of human behavior, and it includes psychology, sociology, and anthropology. These three disciplines are taught together in undergraduate curricula around the world because they are all concerned with understanding human behavior from different perspectives. BS is similar to other basic medical sciences, such as anatomy, biochemistry, physiology, and pathology, in that it explains existing behavior and can be used to predict the behavior of patients and healthcare providers in both clinical and non-clinical situations.

Behavioral sciences are essential for physicians to understand the psychosocial aspects of medical disorders. A physician who has been trained in BS is aware of the impact of history, culture, environment, and psychology on the manifestation of various symptoms. This knowledge allows physicians to communicate more effectively and ethically with their patients, and to develop treatment plans that include not only the patient but also the family.

Behavioral sciences can also be beneficial to medical students on a personal level. By understanding the modern theories of learning, memory, and cognition, students can improve their own learning abilities. Additionally, the knowledge of behavioral sciences can help students to better understand themselves and their relationships with others.

In 2022, the Pakistan Medical & Dental Council (PM&DC) assigned 50 teaching hours to the subject of behavioral sciences in the curriculum of MBBS. This is a significant step in the right direction, as it acknowledges the importance of BS in medical education. It will help to produce physicians who are better equipped to understand and treat the psychosocial aspects of medical disorders. This will ultimately lead to improved patient care.

Rationale

- To provide medical and dental graduates with a broader bio-psycho-social perspective on health and illness.
- To teach students how to use principles of learning and behavior change to enhance their own learning capabilities and to help their patients make positive behavioral changes.
- To help medical graduates develop the ethical and personal qualities necessary to provide compassionate and effective care.

Learning Outcomes of Behavioral Sciences Among MBBS Students:

Upon completion of a BS course in undergraduate MBBS, students should be able to:

KNOWLEDGE:

- Comprehend BS in clinical practice.
- Conceptualize the holistic aspect of medical learning.
- Understand communication skills in clinical and non-clinical settings.
- Understand human cognitive faculties like learning, memory, perception, thinking, intelligence, and meta-cognition that regulate behavior.
- Demonstrate the psychological components of health and disease like defense mechanisms and personality in various behavioral states.
- Apprehend psychosocial issues in special hospital settings.
- Learn psychosocial aspects of aging, death, pain, and terrorism.
- Be aware of sex and gender issues in pre-clinical, clinical, and professional settings.
- Understand and recognize common psychiatric ailments like anxiety, depression, and stress.

SKILLS

- Keep an eye on behavioral issues while working in pre-clinical, clinical, and professional settings.
- Understand patients' stance while taking a comprehensive history or in any other scenario like breaking bad news, conflict resolution, disaster management, information care, etc.

- Communicate well his/her own understanding and strategy in interpersonal relationships.
- Use cognitive and behavioral theories while communicating with others and in any clinical or non-clinical activity.
- Believe in the implication of socio-cultural factors such as gender, race, social class, family, and occupations in health and disease.
- Be able to correlate the psychosocial aspects with the common clinical conditions (DM, Coronary Artery Disease, AIDS, etc.)
- Identify the social and anthropological factors that influence detection, management, compliance, and clinical outcome (stigma, myths, cultural taboo, somatization, etc.)
- Demonstrate stress management skills towards self, patients, and colleagues.
- Be highly concerned about the psychosocial factors in important clinical settings like hospitalization, emergency, ICU, cancer wards, etc.

ATTITUDE

- Exhibit the highest level of ethical and professional standards in his/her character with the patients, colleagues, teachers, relatives, attendants, pharmaceutical industry, and public as a whole.
- Be highly concerned about the rights of patients and doctors envisaged in law, constitution, and religion.
- Acknowledge the social, cultural, and anthropological aspects of health and disease.
- Demonstrate confidentiality and privacy of their patient's information in their clinical practice, interaction with colleagues, and medical/dental and other authorities.
- Undertake an informed consent from the patient.
- Demonstrate principles of these Medical/Dental Ethics in their interactions with patients, their relatives, colleagues, pharmaceutical industry, and medical/dental as well as other authorities.

In conclusion, BS is an essential component of medical education. It provides students with the knowledge, skills, and attitudes necessary to provide comprehensive and patient-centered care.

LEARNING METHODOLOGIES

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

- Lectures
- Interactive Lectures
- Demonstrations
- Hospital / Clinic visits
- Problem- Based Learning (PBL)
- Case- Based Learning (CBL)
- Practical's
- Skills session
- E-Learning
- Self-learning

THEME 1: Introduction to Behavioral Sciences and Its Importance in Health

S#	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY
1.	Comprehend the significance of behavioral sciences in medical practice. Understand the bio psycho-social model in clinical practice, along with the impact of culture on medical practice. gain a comprehensive understanding of psychology, sociology, anthropology, and the biological determinants of health and disease in clinical practice, and be able to identify normal and abnormal behaviors	<p>PAR-S-1-BS-1 Introduction to Behavioral Sciences and its importance in health.</p> <ul style="list-style-type: none"> ● The importance of behavioral sciences in healthcare ● The Bio-psycho-social model of health and illness ● The connection between health and behavioral sciences (psychology, sociology, anthropology). ● The correlation between body, brain, mind and behavioral sciences ● Normality vs. abnormality 	LECTURE

THEME 2: Understanding Behavior

S#	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY
1.	Analyze human behavior by examining factors such as sensation, sensory organs, perception, attention, concentration, memory, thinking, and communication. Evaluate how these elements influence the development of psychological and behavioral disorders, applying clinical reasoning and fostering personal growth in learning and practice.	<p>PAR-S-1-BS-2 Understanding Behavior: Sensation, Perception, Attention, Memory, Thinking, and Communication.</p> <ul style="list-style-type: none"> ● Explore sensation and the functions of sensory organs. ● Define perception, its influencing factors, and abnormalities, including extrasensory perception (ESP). ● Examine attention and concentration, focusing on factors that affect their efficacy. ● Discuss memory, including its stages, types, and strategies for enhancement. ● Analyze thinking, its types, and related theories, along with levels of cognition, problem-solving techniques, and decision-making strategies. ● Define communication, highlighting its types, modes, influencing factors, non-verbal cues, and the characteristics of effective communication. 	LECTURE

THEME 3: THEME 3: Individual Differences

S#	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY
1.	Analyze the types of human personality and the stages of personality development, emphasizing their influence on behavior and growth. Assess the role of intelligence in shaping personal and professional success.	<p>PAR-S-1-BS-3 Understanding Individual Differences: Personality, Intelligence.</p> <ul style="list-style-type: none"> • Explore the stages and key characteristics of psychological human growth and development. • Define personality and examine cognitive and psychodynamic theories, factors influencing personality development, and methods of assessment. Analyze how personality impacts responses to health, disease, hospitalization, and stress. • Define intelligence and its various types, including IQ and EQ, and their relevance in a doctor’s life. Discuss strategies to enhance EQ and effectively utilize IQ. • Examine factors • influencing intelligence and methods of assessment. 	LECTURE
2.	Explain the complex relationship between brain function and behavior, focusing on emotions, motivation, and learning, as well as strategies to manage and enhance these processes effectively.	<p>PAR-S-1-BS-4 Interplay of Brain and Behavior: Emotions, Motivation/need/drive and Learning</p> <ul style="list-style-type: none"> • Define emotions, their types, and the concept of Emotional Quotient (EQ), emphasizing emotional literacy and its practical utility. • Define motivation, its types, and the application of motivational theories to improve learning and treatment adherence. • Define learning and explore its principles, modern methods, learning styles, and types of learners. Discuss cognitive theories of learning and strategies to enhance learning skills effectively 	LECTURE

THEME 4: Doctor-Patient Relationship and Medical Ethics

S#	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY
1.	Critically evaluate complex clinical scenarios to identify and resolve ethical and practical challenges while upholding ethical boundaries within the doctor patient relationship. Demonstrate professionalism and strive for excellence in fostering trust and maintaining a healthy, effective doctor-patient dynamic.	<p>PAR-S-1-BS-5 Doctor-Patient Relationship and Medical Ethics.</p> <ul style="list-style-type: none"> • Professional boundaries and psychological aspects (e.g., transference, counter-transference). • Ethical principles: Hippocratic Oath, medical/dental ethics, and patient-doctor rights (international law, Pakistan’s Constitution, PM&DC, Islam). • Ethical dilemmas in interactions with families, colleagues, and the pharmaceutical industry. • Emerging issues: e-consultation, telemedicine, • euthanasia, and physician-assisted suicide 	LECTURE

THEME 5: Communication skills and Non-Pharmacological Interventions

S#	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY
1.	Demonstrate effective communication skills in clinical practice, including the use of non-pharmacological interventions such as counseling, providing informational care, and sensitively breaking bad news, in conjunction with appropriate medication management. Effectively handle patient information across diverse clinical scenarios while maintaining confidentiality and professionalism. Develop the ability to navigate and manage uncertain situations with confidence and empathy in clinical practice	<p>PAR-S-1-BS-6</p> <p>Communication skills and Non- Pharmacological Interventions (NPIs) in Clinical Practice.</p> <ul style="list-style-type: none"> Principles of effective communication: active listening, the art of questioning, and the art of listening. Characteristics of good and bad listeners. Counseling: Scope, indications, contraindications, steps, do's and don'ts. Managing real-life crisis and conflict situations in health settings. Informational Care: Communicating with patients about disease, medications, prognosis, etc. Breaking bad news: Introduction, model, and approach to patient and caregivers 	LECTURE

COMMUNITY MEDICINE

LEARNING OUTCOMES:

- This module has been designed to introduce the basics of Community Medicine and Public health sciences.
- The course will cover the Introduction about community medicine and difference between clinical and community medicine.
- This module will also clear the concept of health and diseases and their determinants and help in understanding the level of prevention.
- This module will teach the various National and International health issues and their agendas.
- At the end of this module, students will be able to understand the basics of community medicine, its role and importance for clinicians.

RATIONALE:

Community Medicine is the main branch of medicine concerned with the health of people. It aims to protect and promote the health and well-being of the community through the Primary Health Care approach. Community Medicine plays an important role for making effective intervention and prevention strategies; it is also helpful for greater understanding of the risk factors of chronic disease processes and their effects on function and quality of life. So, the essential mission of teaching Community Medicine is to contribute in the development of a well-formed health professional.

S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY
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01	<ul style="list-style-type: none"> To define different definitions of public health / Community Medicine To learn the evolution of public health, its importance in today's world To discuss the basic functions of public health/community Medicine To define the difference between clinical and community medicine 	<p>PAR-S-1-CM-1 Introduction to Community Medicine & Public Health (introduction to course/ department/ faculty)</p>	LECTURE
02	<ul style="list-style-type: none"> To understand the concept of disease and health To discuss the Spectrum of health and the Iceberg phenomenon of disease To understand the Health Dimensions 	<p>PAR-S-1-CM-2 Concept of Health and Disease</p>	LECTURE
03	<ul style="list-style-type: none"> To understand determinants of health with special focus on social determinants of health (SDH) To define responsibility for Health To define a health indicator To describe the Types of indicators 	<p>PAR-S-1-CM-3 Determinants of Health and Health Indicators</p>	LECTURE
04	<ul style="list-style-type: none"> To define Health To discuss the "health for All", background, concepts and progress. To define Primary health care To discuss the Alma Ata Declaration To discuss the Universal health coverage To learn about health delivery system of Pakistan 	<p>PAR-S-1-CM-4 Primary Health Care": Concepts and progress, and Health Delivery system of Pakistan</p>	LECTURE

05	<ul style="list-style-type: none"> To discuss the important global health issues To understand the important public health issues of Pakistan To define the health inequalities <ul style="list-style-type: none"> Developing vs developed, urban vs, rural, rich vs poor, male vs female To discuss the health and its relationship with development To learn global development goals <ol style="list-style-type: none"> I. Millennium Development goals (MDGs) II. Sustainable Development Goals (SDGs) 	<p>PAR-S-1-CM-5 Global and Local health issues & Global Health Agendas</p>	LECTURE
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INFORMATION TECHNOLOGY

Introduction/ Rationale

The integration of information technology into the MBBS (Bachelor of Medicine and Bachelor of Surgery) curriculum is essential in today's rapidly evolving healthcare landscape. IT proficiency is vital, as it will equip MBBS students with the skills needed to navigate electronic health records, telemedicine platforms, and advanced diagnostic tools. It enables efficient data management and evidence-based decision-making. Moreover, IT skills are crucial for facilitating interdisciplinary collaboration, ensuring that MBBS graduates can research, access academic literature, and adapt to emerging healthcare technologies. By incorporating an IT module, the MBBS curriculum aligns with the evolving healthcare environment. It is time that healthcare professionals stay updated with the latest medical research, clinical guidelines, and best practices. IT modules will help students leverage digital resources for continuous learning, including online courses, webinars, and virtual conferences, ultimately leading to ongoing professional development. Understanding healthcare management systems, hospital information systems (HIS), and administrative software is crucial for effective healthcare administration. IT modules will provide relatable knowledge to students.

Learning Outcomes

After completing this IT module, students will be able:

- To effectively use office software (e.g., Microsoft office, google workspace) for tasks such as word processing, spreadsheet analysis, and presentation creation.
- To organize, store, and manage medical documents and reports using office automation tools.
- To proficiently use medical databases (e.g., PubMed, The Cochrane Library) to access scholarly articles, research, and evidence-based resources.
- To edit medical images and videos for presentations, reports, and patient education, ensuring accuracy and clarity.
- To use visuals effectively to convey medical information, diagnoses, and treatment plans.
- To comprehend the fundamental principles of electronic health records (EHR), including their structure, purpose, and functionalities. They will learn to enter, update, and manage patient information and medical records in EHR systems.

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES			
S. #	LEARNING OBJECTIVES	TOPIC	TEACHING STRATEGY
01	To learn the basics of IT, its importance, benefits, and major areas of Information Technology	PAR-S-1-IT-1 Introduction to IT & its Importance in Healthcare	Lecture
		PAR-S-1-IT-2 Advanced applications of IT in healthcare (AI, EHR, mHealth, IoT)	
02	Learn efficient content delivery and resource management in a digital environment	PAR-S-1-IT-3 Google Classroom	Practical
03	Comprehensive understanding of computer system components, their functions, and the skills necessary for hardware maintenance, troubleshooting, and optimization	PAR-S-1-IT-4 Components of a Computer System	Lecture
		PAR-S-1-IT-5 Hardware & Software	
		PAR-S-1-IT-6 Types of Software	
		PAR-S-1-IT-7 Software Installation and Troubleshooting	Practical
		PAR-S-1-IT-8 Operating System	Lecture
		PAR-S-1-IT-9 Microprocessors, mobile computing	
04	Developing skills in document design, enhancing aesthetics for professional presentations and reports. Learn to Explore advanced techniques for data visualization	PAR-S-1-IT-10 Word Processing Software	Practical
		PAR-S-1-IT-11 Presentation Software	
		PAR-S-1-IT-12 Data Analysis using MS Excel software	

Recommendation:

Relevant reading material and supplementary handouts will be provided during classes/ lectures

BIOMEDICAL ETHICS

Introduction/ Rationale

The rationale for teaching Biomedical Ethics to MBBS students at LUMHS is rooted in several important considerations related to the fields of medicine, healthcare, and related professions. This will provide ethical guidance and education, promote ethical behavior, protect patient rights and resolve ethical dilemmas. This will help students as future professionals to navigate complex ethical challenges and ensures that ethical principles and values are integrated into the practice of medicine, research, and other professional fields. Ultimately, this course will play a vital role in promoting ethical conduct and maintaining the trust and integrity of these professions.

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES			
S #	LEARNING OUTCOMES	TOPIC	TEACHING STRATEGY
01	<ul style="list-style-type: none"> • Students should be able to understand the principles of bioethics and what is ethical practice is and what an ethical dilemma • Students should be able to understand harms and benefits in health care settings • Students should be able to understand the concepts of autonomy and individual responsibility and to understand their significance for the health care provider patient relationship • Students should be able to understand concept of non-maleficence and Hippocratic oath • Students should be able to understand concept of justice in health care setting and equity in resource allocation 	<p>PAR-S-1-ETH-1 Introduction to Biomedical Ethics</p>	<p>Lecture SGD</p>

RESEARCH

Introduction

The foundation of any institution is research. Advanced nations assert that their advancements in research and development have modernized them and enabled them to generate revenue. Globally, medical universities are essential to the advancement of healthcare. Beginning with health issue prediction surveys and continuing with the creation of innovative medications and diagnostic methods.

Any institution's greatest asset is its student population. Here, we offer the guidelines and framework for research curriculum, which will assist you in reaching degree program standards.

The scientific research element of the medical curriculum aims to develop a research-oriented mindset in students that promotes evidence-based practice, critical thinking, and a more comprehensive understanding of medical science. This module focuses on bridging the knowledge gap between theory and clinical application by giving students the tools they need to carry out significant medical research.

Rationale

Research is essential to expanding our understanding of medicine and enhancing patient care. Students who engage in research projects improve their analytical and critical thinking skills, strengthen their capacity to understand scientific literature, and make a positive impact on the continuous advancement of medical science. Students' academic journeys are further enhanced by research experiences, which equip them to make evidence-based decisions in their future healthcare endeavors.

Learning Objectives:

- **Develop Research Competence:** Get the know-how required to plan, carry out, and evaluate medical research on your own.
- **Critical Thinking:** Gain the capacity to evaluate scientific literature critically, understanding research techniques and coming to conclusions supported by data.
- **Communication Skills:** Improve your written and verbal communication abilities to effectively communicate research findings to a variety of audiences.
- **Ethical Considerations:** Show your dedication to responsible and open scientific inquiry by understanding and putting ethical principles into practice in your research.

TOPICS WITH SPECIFIC LEARNING OBJECTIVES AND TEACHING STRATEGIES

S #	LEARNING OBJECTIVE	TOPICS	TEACHING STRATEGY
1	Define Research Fundamentals	PAR-S-1-RES-1 Introductory class	Lecture
2	Describe Fundamentals of Biostatistics	PAR-S-1-RES-2 Introduction to Biostatistics	
3	Enlist the types of research variables	PAR-S-1-RES-3 Types of Research Variables	
4	Identify methods of measuring Central Tendencies & Measures of Dispersion	PAR-S-1-RES-4 Central Tendencies & Measures of Dispersion	
5	Summarize the Concepts of basic research	PAR-S-1-RES-5 Basic Research	
6	Demonstrate an understanding of different research designs	PAR-S-1-RES-6 Study Designs	
7	Summarize and synthesize relevant literature to establish the research context	PAR-S-1-RES-7 Literature search	
8	Identify and apply appropriate research methods and techniques.	PAR-S-1-RES-8 Basic Laboratory Techniques	
9	Define a research proposal and its contents	PAR-S-1-RES-9 What is a research proposal, and how to write it?	
10	Define a research proposal and its contents	PAR-S-1-RES-10 What are the components of proposal writing?	
11	Define a research proposal and its contents	PAR-S-1-RES-11 Presentation of Research Proposal	Discussion



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DIRECTOR

"SAY NO TO CORRUPTION"

**TABLE OF SPECIFICATION FIRST YEAR MBBS
(BATCH 2024-2025)**

S.NO	SUBJECTS	ANA		PHY		BIO		PHAR		PATHO		B.S BME MEDICAL RESEARCH		GRAND TOTAL
		FOU		FOU		FOU		FOU		FOU		FOU		
01.	PAPER - I (FOUNDATION AND BLOOD -1) Anatomy, Physiology , Biochemistry Pathology , Pharmacology Community Medicine , B.S BME MEDICAL RESEARCH	FOU	18	FOU	11	FOU	12	FOU	06	FOU	03	FOU	04	100
		BLOOD I	07	BLOOD I	11	BLOOD I	10	BLOOD I	03	BLOOD I	11	BLOOD I	04	
		TOTAL	25	TOTAL	22	TOTAL	22	TOTAL	09	TOTAL	14	TOTAL	08	
02.	PAPER - II (MUSCULO SKELETAL) Anatomy, Physiology , Biochemistry Pathology , Pharmacology Community Medicine , B.S BME MEDICAL RESEARCH	TOTAL	52	TOTAL	16	TOTAL	16	TOTAL	01	TOTAL	05	TOTAL	05	100
03.	PAPER - III (REPIRATORY I AND CVS- 1) Anatomy, Physiology , Biochemistry Pathology , Pharmacology Community Medicine , B.S BME MEDICAL RESEARCH	CVS I	20	CVS I	16	CVS I	08	CVS I	01	CVS I	02	CVS I	03	100
		RESP I	20	RESP I	13	RESP I	08	RESP I	02	RESP I	03	RESP I	04	
		TOTAL	40	TOTAL	29	TOTAL	16	TOTAL	03	TOTAL	05	TOTAL	07	



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DIRECTOR

"SAY NO TO CORRUPTION"

OSPE EXAMINATION FIRST YEAR MBBS

S.NO	SUBJECTS OF INTERACTIVE STATIONS	NUMBER OF INTERACTIVE STATIONS	MARKS OF EACH STATIONS	TOTAL MARKS
01.	ANATOMY	03	20 MARKS EACH STATION	60 MARKS
02.	PHYSIOLOGY	03	20 MARKS EACH STATION	60 MARKS
03.	BIOCHEMISTRY	03	10 MARKS EACH STATION	30 MARKS
TOTAL MARKS OF INTERACTIVE STATIONS =				150

S.NO	SUBJECTS FOR STATIC STATION	NUMBER OF STATIC STATIONS	MARKS OF EACH STATIONS	TOTAL MARKS
01.	ANATOMY	06	06 MARKS EACH STATION	36 MARKS
02.	PHYSIOLOGY	06	06 MARKS EACH STATION	36 MARKS
03.	BIOCHEMISTRY	03	06 MARKS EACH STATION	18 MARKS
TOTAL MARKS OF STATIC STATIONS =				90

INTERNAL EVALUATION MARKS	20 MARKS OF EACH MODULE / PAPER	60 MARKS OF INTERNAL EVALUATION
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GRAND TOTAL

TOTAL INTERACTIVE MARKS	150
TOTAL STATIC MARKS	90
INTERNAL EVALUATION MARKS	60
GRAND TOTAL	300

EXAMINATION ASSESSEMENT

ASSESSMENT PLAN FOR EACH PAPER	END OF YEAR ASSESSMENT	INTERNAL EVALUATION	TOTAL %AGE
THEORY (SBQS)	80%	20%	100%
PRACTICAL EXAM (OSVE; OSPE)	80%		

ALLOCATION OF INTERNAL ASSESSMENT MARKS		
COMPONENT	SCORING MATRIX	PERCENTAGE
THEORY	ATTENDANCE (>90%=03; 89-80%=02; 79-70%=01;<70%=00)	3%
	Module tests	3%
	Block tests	4%
		10%
PRACTICAL	ATTENDANCE (>90%=03; 89-80%=02; 79-70%=01;<70%=00)	3%
	Module tests including ethics, conduct, practical's, assignments)	3%
	Block tests	4%
		10%
TOTAL		20%

SCHEME OF INTERNAL ASSESSMENT/EVALUATION-20%-2025			
Overall attendance		7%	
Modular Test/Ward test/OPD Test		2% (6%)	
SURVIVE		7%	
SURVIVE 7%			
Final Year		Remaining Years	
Test	3%	t	3%
Assignment	2%	ignment	2%
Post Test Discussion	2%	D/Practical Book/Logbook	2%
Total	7%	al	7%

LEARNING RESOURCES

Anatomy:

❖ GROSS ANATOMY

- Clinical Anatomy by Richard S. Snell
- K.L. Moore, Clinically Oriented Anatomy
- Neuro Anatomy by Richard Snell

❖ HISTOLOGY

- B. Young J. W. Health Wheather's Functional Histology

❖ EMBRYOLOGY

- Keith L. Moore. The Developing Human
- Langman's Medical Embryology

❖ BIOCHEMISTRY:

- Harper's Illustrated Biochemistry
- Lehninger Principle of Biochemistry
- Biochemistry by Devlin

❖ COMMUNITY MEDICINE:

- Community Medicine by Parikh
- Community Medicine by M Illyas
- Basic Statistics for the Health Sciences by Jan W Kuzma

❖ PATHOLOGY / MICROBIOLOGY:

- Robbins & Cotran, Pathologic Basis of Disease, 9th edition.
- Rapid Review Pathology, 4th edition by Edward F. Goljan MD

❖ PHARMACOLOGY:

- Lippincot Illustrated Pharmacology
- 2. Basic and Clinical Pharmacology by Katzung

❖ PHYSIOLOGY:

- Textbook of Medical Physiology by Guyton And Hall
- Ganong' S Review of Medical Physiology
- Human Physiology by Lauralee Sherwood
- Berne & Levy Physiology
- Best & Taylor Physiological Basis of Medical Practice
- Guyton & Hall Physiological Review
- Essentials of Medical Physiology by Jaypee
- Textbook of Medical Physiology by InduKhurana
- Short Textbook of Physiology by Mrthur

- N ogy
- M ology
 - Monoo's Physiology

❖ **BEHAVIORAL SCIENCES:**

- P h y s i c i a n s
 - Hand book of Behavioral Sciences by Brig (Rtd) Mowadat H Rana (3rd Edition)
 - Introduction To Psychology By Atkinson & Hilgard (15th Edition)
 - Shorter Oxford Textbook of Psychiatry (7th Edition)

❖ **BIOMEDICAL ETHICS:**

- o l d
 - Beauchamp TL, Childress JF. Principles of biomedical ethics. Oxford University Press, USA; 2001

❖ **RESEARCH:**

- "Basic Biostatistics for Clinical Researchers" by Prof. Dr. Binafsha Manzoor Syed, PhD et al.

Weblink: <https://www.lumhs.edu.pk/publishers/documents/basicbio.pdf>

- "Research Methodology in Medicine" by John K. Last

Weblink: <https://kth.diva-portal.org/smash/get/diva2:1547062/FULLTEXT01.pdf>

Journals:

- New England Journal of Medicine
- Nature Medicine
- Journal of clinical investigation (JCI)
- Circulation

Online Databases:

- PubMed

THE END