

STUDY GUIDE PHYSIOLOGY 1ST Year

MBBS COURSE

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Mission Statement



Guiding your passion to profession

IMC Strives to improve health care in Faisalabad, our country and the world through excellence.

We seek to foster the development of dedicated clinicians, scientists, professionals and educators to provide leadership in education, services and discovery.

Vision:

To be an institution with

- An environment to develop creative free thinking and life long learners.
- A culture of objective research to transform health care delivery.
- Quality professional educational program based on innovation and collaboration.
- High moral and ethical values.
- Serving the needs of community in the best tradition of profession.

Goals:

- To develop humanist, skilled, intellectually disciplined and innovative medical professionals with dedication to those who they treat, lead and serve
- To educate and guide the next generation of leaders in healthcare and medical science to provide and sustain achievements in service, teaching and research.
- To provide comprehensive and effective patient centered, culturally sensitive, compassionate and innovative health care of highest quality to all.
- To recruit, develop and nurture and independent and academically outstanding community of faculty, student, trainees and staff, who each contribute to excellence in our missions.
- To promote professional and personal growth, productive, accountability, integrity and synergistic collaboration and synergy of faculty, students and staff

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INTRODUCTION

WHAT IS A STUDY GUIDE?

It is an aid to:

- A. Inform students how student learning program of the subject has been Organized
- B. Help students organize and manage their studies throughout the year
- C. Guide students on assessment methods, rules and regulations

THE STUDY GUIDE:

- Communicates information on organization and management of the module.
- This will help the student to contact the right person in case of any difficulty.
- Defines the objectives which are expected to be achieved at the end of the program.
- Identifies the learning strategies such as lectures, small group teachings, clinical skills, Demonstration, tutorial and case based learning that will be implemented to achieve the Learning objectives.
- Provides a list of learning resources such as books, computer assisted learning program, web- links, and journals, for students to consult in order to maximize their learning.
- Highlights information on the contribution of continuous and term test on the Student's overall performance.
- Includes information on the assessment methods that will be held to determine every student's Achievement of objectives.
- Focuses on information pertaining to examination policy, rules and regulations.

PHYSIOLOGY FOR 1ST YEAR MBBS

Subject: Physiology

Year: 1st year

Duration: 36 weeks

Year	Theory	Practical	Total
1st year	150 hours (100 Lecture, 50 SGD / PBL)	150 hours	300

AT THE END OF 1st YEAR MBBS STUDENT WILL BE ABLE TO

- To explain various physiological terms.
- To distinguish different physiological mechanism.
- To discuss principles of Physiology.
- To demonstrate ability to perform certain laboratory test.
- To describe various normal laboratory reports.
- To explain the physiological principles of different clinical methods.
- To identify different cellular structures & tissue on microscopic slides.
- To describe different organs & functioning of physiological systems.
- To explain the clinical application of knowledge of Physiology.
- To describe function of human organs.
- To discuss various homeostatic anomalies.

RULES AND REGULATION

- 75% attendance in theory and clinical classes in mandatory.
- All progress will be recorded on clinical log book.
- Pass marks for assessment will be 50%.
- All this will be credited in internal assessment for Final Professional.
- Any Conflict will be resolved by Co-Ordinator.
- All students will have to fill online feedback perfroma.

LEARNING RESOURCES

The department of Anatomy will require following resources for implementation resources:

- Human resource
- Instructors (faculty members)
- Curriculum coordinator curriculum secretary
- Infrastructure
- Lecture hall with AV aids
- Tutorial room with AV aids
- Dissection Hall and Museum with Anatomy Models
- Histology Lab with Pool of slides
- Simulated patients and simulated manikins
- Computers

LISTS OF CONTENT RESOURCES

- Textbook of Physiology by Guyton and Hall, Latest Ed.
- Review of Medical Physiology by William F. Ganong, Latest Ed.
- Human Physiology by Laurali Sherwood.
- Physiology by Berne and Levy, Latest Ed.
- Physiology by Linda and Constanzo.

E-LEARNING

- e-IMC phone app for online lectures
- IMC youtube channel

JOURNALS

- The Professional Medical Journal
- Independent Review (H-2000)
- Independent Journal of Allied Health Sciences
- Online Journals and Reading Materials through HEC Digital Library Facility

LEARNING METHODOLOGY

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

- Interactive Lectures
- Hospital / Clinic visits
- Small Group Discussion
- Case- Based Learning
- Skills session
- E-Learning
- Self-Directed Study

INTERACTIVE LECTURES: In large group, the lecturer introduces a topic or common clinical conditions and Explains the underlying phenomena through questions, pictures, videos of patients' interviews, Exercises, etc. Students are actively involved in the learning process.

SMALL GROUP DISCUSSION (SGD): This format helps students to clarify concepts acquire skills or attitudes. Sessions are structured with the help of specific exercises such as patient case, interviews or discussion topics. Students exchange opinions and apply knowledge gained from lectures, tutorials and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

CASE- BASED LEARNING: A small group discussion format where learning is focused around a series of questions based on a clinical scenario. Students discuss and answer the questions applying relevant knowledge gained in clinical and basic health sciences during the module.

SKILLS SESSION: Skills relevant to respective module are observed and practiced where applicable in skills laboratory or Department of Physiotherapy.

SELF DIRECTED STUDY: Students assume responsibilities of their own learning through individual study, sharing and discussing with peers, seeking information from Learning Resource Center, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self-study.

E-LEARNING: E-Learning is a strategy by which learning occurs through the utilization of electronic media, typically the Internet. The basic aspects of medical professionalism and ethics will be addressed through an e-learning course

VIDEO SESSIONS: Anatomy is a subject which involves visual learning and formulating concepts. Video assisted learning sessions also provides opportunities to learn gross anatomy.

LABORATORY SESSIONS: Laboratory sessions are important as they provide opportunity for experiential learning in terms of study of slides and identification of tissues

EARLY CLINICAL EXPOSURE (ECE): Clinical skills session are important part of curriculum to achieve psychomotor and affective outcomes. This provide opportunity for medical students in early years and will stimulate contextual learning.

ASSESSMENT

MCQ's and SEQ's

Multiple choice question and short essay question test will be used at the end of part of curriculum to assess the learning of knowledge. These all assessment exercises will be formative. The written tests like Multiple-Choice Questions (MCQs) and Short-Essay Questions (SEQs) test formats are used for the assessment of cognitive domain. The MCQs are more objective and essentially select type of item response format. MCQs have a cueing effect, which promotes guessing and leads to higher scores. In addition, writing MCQs of higher cognitive level of problem solving is challenging. On the contrary, the SEQs are more subjective and have a supply or construct type item response format, which does not have any cueing effect and can effectively assess problem solving skills(8).

OSCE AND SHORT CASE

Short case and OSCE will be used to evaluate clinical skills and procedural skills at the ward end of placement. The OSCE is a method of clinical skill assessment, and it has been reported to be appropriate for assessing learning achievement levels in the psychomotor and emotional domains, which are difficult to evaluate with written examinations(9).

VIVA VOCE

Viva voce is used for assessment of knowledge and problem solving ability of students. This method is useful evaluating cognitive domain.

ASSIGNMENTS

Students of different year will be given assignment of different nature such as research and literature search and surveys

Evaluation plan		
Term Test	Written test (MCQ and SEQ)	Formative
After each region / Module	Term Test (OSCE and viva voce)	Formative

INTERNAL ASSESSMENT

- The weightage of internal assessment shall be 10% of totals marks.
- Continuous internal assessment shall consist of evaluation at the end of each assignments, e.g. stages/ sub-stage, class tests etc., attitudinal assessment from educational supervisors.
- Assessment of knowledge, Skills and Attitude shall contribute toward internal assessment. Methods used to assess these domains shall include Multiple Choice Questions of one-best type, Short essay questions, Oral/Viva, and Practical/Clinical examinations.
- The score of internal assessment shall contribute to the score in the final examination, Final university examination of each subject shall contribute 90 to total score, and the candidate shall pass in aggregate.
- Proper record of continuous internal assessment shall be maintained.



PHYSIOLOGY 1ST YEAR MBBS

EDUCATION PLAN

	Module	Topic	Assessment	Week
1st Term (11 weeks)		Homeostasis		1
		Organelles & Transport	Test 1 MCQs / SEQs	2
		Generics introduction anemia, RBC		3
		WEB, blood types & transfusion	Test 2 MCQs / SEQs	4
		immunity		5
		Blood coagulation & hemostasis	Test 3 MCQs / SEQs	6
		Basic physics & RMP		7
		Action potential	Test 4 MCQs / SEQs	8
		Anatomy & physiology of skeletal		9
		Homeostasis, cell, blood & nerve		10
	1st Term Test			11
2nd Term (11 weeks)		Muscle contraction skeletal		12
		Smooth muscle contraction		13
		Varalia muscle & functions	Test 5 MCQs / SEQs	14
		Excitation of caralia muscle		15
		ECG & arrhythmia	Test 6 MCQs / SEQs	16
		Biophysics of circulation & Microcirculation		17
		Nervous regulation	Test 7 MCQs / SEQs	18
		Local control & B.P regulation		19
		CO & venous return		20
		Nerve & muscle, heart, CVS (Partially)	Test 8 MCQs / SEQs	21
	2nd Term Test			22
3rd Term (9 weeks)		Circulatory stock		23
		Pulmonary ventilation		24
		Pulmonry circulation & edema	Test 9 MCQs / SEQs	25
		Gas exchange & Transport of gases		26
		Regulation of respiration	Test 10 MCQs / SEQs	27
		Skin & temperature		28
		Sports physiology	Test 11 MCQs / SEQs	29
		CVS, respiration, skin & body temperature	Test 12 MCQs / SEQs	30
(4 Weeks)	3rd Term Test			31
	Preparation Leaves			32
				33
				34
				35
	Sendup Examination			36

DEPARTMENT OF MEDICAL EDUCATION

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Modules	Objectives	Instructional strategy				Assessment			
		Lecture	SGD	PBL	Lab	MCQ	SEQ	OSPE	Viva
Module 1: Basic and Cell Physiology	Understand functional organization of human body								
	Describe homeostasis I control systems in the body.								
	Describe structure, functions of cell membrane.								
	List cell organelles and describe their functions								
	Understand basic concepts about DNA and RNA								
Module 2: Blood	Describe the composition and general functions of blood								
	Enumerate plasma proteins, give their properties.								
	Explain erythropoiesis and factors affecting erythropoiesis								
	Explain the functions of red blood cell								
	Describe functions of hemoglobin and enumerate its different types.								
	Describe the role of various elements, iron in hemoglobin synthesis.								
	Enumerate and define various blood indices								
	Explain leucopoiesis and types and functions of white blood cells.								
	Describe monocyte-macrophage system and functions of spleen								
	Explain various types of immunity								
	Explain thrombocytopoiesis and describe functions of platelets								
	Explain hemostasis, blood coagulation, fibrinolysis and anticoagulants								
	Explain the blood groups and their role in blood transfusion								
	Understand fate of red blood cells and bilirubin formation								
	Describe Anemia, its types and the effects on human body								
	Explain Polycythemia, its types and effects on the human body								
	Outline of Blood indices in various disorders								
	Describe Clotting and bleeding disorders								
	Explain Hazards of blood transfusion								
	Discuss Rh incompatibility								
	Explain Abnormal immune responses								
	Describe pathology and types of Jaundice								
	Demonstrate Use of the microscope								
	Determination of haemoglobin								
	Demonstrate Osmotic fragility of RBCs								
	Determination of Blood groups								
	Determination of erythrocyte sedimentation rate								
	Determination of packed cell volume								
	Determination of bleeding and clotting times								
	Determination of RBC count, Platelet count, Red cell indices.								
	Determination of Total Leukocyte count, Differential leucocyte count.								

Modules	Objectives	Instructional strategy				Assessment			
		Lecture	SGD	PBL	Lab	MCQ	SEQ	OSPE	Viva
Module 3: Nerve and Muscle	Explain the structure of the neuron the properties of nerve fibers								
	Classify the nerve fibers								
	Describe the physiological basis of resting membrane potential								
	Describe the genesis of action potential & compound action potential								
	Describe the propagation of action potential								
	Outline the structural-functional relationship of skeletal muscle								
	Describe neuromuscular junction and transmission								
	Explain mechanism & characteristics of contraction of muscle types.								
	Differentiate between the isometric and isotonic contraction								
	Compare the difference between tetany and tetanization								
	Describe excitation contraction coupling								
	Explain chemical changes during muscle contraction & muscle fatigue								
	Describe peripheral nerve injuries								
	Discuss Myasthenia gravis, Muscular dystrophy								
	Explain Muscular hypertrophy/atrophy								
	Explain Rigor mortis/contracture								
	Demonstrate Drugs/poisons affecting neuromuscular junctions								

Modules	Objectives	Instructional strategy				Assessment			
		Lecture	SGD	PBL	Lab	MCQ	SEQ	OSPE	Viva
Module 4: Cardiovascular system	Describe scheme of circulation through the heart and body.								
	Describe the properties of cardiac muscles.								
	Explain the generation of cardiac impulse and its conduction.								
	Compare action potential of SA node and ventricular myocardium.								
	Describe the various events in cardiac cycle.								
	Explain the mechanism for production of heart sounds.								
	Describe the lead systems for a 12 lead ECG.								
	Define, draw and label normal ECG and explain the physiologic basis of waves, segments and intervals.								
	List types of blood vessels and their function.								
	Describe the haemodynamics of blood flow.								
	Explain the microcirculation and capillary dynamics.								
	Discuss peripheral resistance its regulation and effect on circulation								
	Describe the arterial pulse								
	Define venous return and explain the factors affecting it.								
	Explain cardiac output and its control								
	Describe blood pressure and its regulation								
	Describe coronary circulation and factors affecting it								
	Describe the factors regulating cerebral and cutaneous circulations								
	Define shock and its various types.								
	Describe the various stages of shock & physiological compensation.								
	Basic concepts related to electrical axes and cardiac vectors								
	Differentiation between various ECG recordings on the basis of rate and rhythm (bradycardia, tachycardia, heart-blocks, ventricular fibrillation, atrial fibrillation, myocardial ischemia I infarction)								
	Describe development of Oedema								
	Explain Effects of hypertension and cardiac failure								
	Describe Clinical significance of heart sounds and murmurs								
	Describe the physiology of Varicose veins								
	Demonstrate Cardiopulmonary resuscitation								
	Demonstrate Examination of arterial pulse								
	Perform Examination of jugular venous pulse								
	Perform EGG recording and interpretation of normal EGG								
	Demonstrate Recording of arterial blood pressure								
	Demonstrate Effects of exercise and posture on blood pressure								
	Examination Apex beat and normal heart sounds								
	Demonstrate Triple response								
	ICU I CCU I Medical ward visit to study the cases of CCF, Murmurs, Hypertension, Myocardial infarction etc.								

Modules	Objectives	Instructional strategy				Assessment			
		Lecture	SGD	PBL	Lab	MCQ	SEQ	OSPE	Viva
Module 5: Respiratory system	Describe the functional organization of the respiratory tract.								
	Describe respiratory & non-respiratory function of the respiratory tract								
	Explain the mechanics of breathing								
	Describe production & function of surfactant & compliance of lungs								
	Describe the protective reflexes								
	Explain lung volumes and capacities including dead space								
	Describe pulmonary circulation and pulmonary capillary dynamics								
	Describe the composition of atmospheric, alveolar and expired air								
	Describe the diffusion of gases across the alveolar membrane								
	Explain the relationship between ventilation and perfusion								
	Describe transport of oxygen and carbon dioxide in blood								
	Describe the nervous and chemical regulation of respiration								
	Explain abnormal breathing								
	Define and explain hypoxia, its causes and effects								
	Define and explain cyanosis, its causes and effects								
	Describe Causes of abnormal ventilation and perfusion								
	Explain effects of asthma, pneumothorax, pleural effusion & pneumonia								
	Describe Respiratory failure								
	Explain Artificial respiration and uses & effects of O ₂ therapy								
	Discuss significance of hypoxia, asphyxia, cyanosis, and dyspnoea								
	Explain Respiratory distress syndrome								
	Differentiate between obstructive and restrictive lung disorders on the basis of pathophysiology and lung function test								
	Explain Respiratory acidosis and alkalosis.								
	Demonstrate Clinical examination of respiratory system								
	Record Pulmonary volumes, capacities and their clinical interpretation								
	Recording of respiratory movements using Stethograph								
Module 6: Skin and body temperature	Describe body temperature regulation								
	Describe functions of skin								
	Abnormalities of temperature regulation								
	Recording of body temperature								
Module 7: Human responses in varied environments	Describe CVS, muscular & respiratory adjustments in exercise								
	Explain physiologic responses to high altitude and space								
	Explain physiologic responses to deep sea diving and hyperbaric conditions								
	Describe Acute and chronic mountain sickness								
	Explain Nitrogen narcosis and decompression sickness								

TABLE OF SPECIFICATION (ToS)			
		MCQ'S	SEQ'S
	Basic and Cell Physiology	02	01
	Blood	09	02
	Nerve and Muscle	09	02
	Temperature Regulation	02	0.5
	Cardiovascular System	14	02
	Respiratory System	07	01
	Human Responses in Varied Environments	02	0.5
	Total	45	09

PHYSIOLOGY**Total marks: 90**

The structure of OSPE/ Practical/ Viva should be as follows:

Viva Voice (35 marks)

- Internal — 15 marks
- External — 20 marks

OSPE (25 marks)

- Non-observed stations 10 of 01 marks each (2 minutes each)
- Observed stations 03 of 05 marks each (4 minutes each)

30% C1, 40% C2, 30% C3 OSPE

Practical (30 marks)

- Practical 20 marks
- Procedure Writing 05 marks
- Yearly Workbook Assessment 05 marks



WEEKLY TIME TABLE

1ST YEAR MBBS INDEPENDENT MEDICAL COLLEGE, FAISALABAD.

Time	08:00-10:00	10:00-11:45	BREAK 11:45 TO 12:15		Lecture 12:15-02:00	SGD / Practical 12:15-02:00
Mon	Anatomy	Physiology			Biochemistry	SDL (Self Directed Learning)
Tue	Anatomy	Physiology			Biochemistry	SDL (Self Directed Learning)
Wed	Anatomy	Physiology			Biochemistry	SDL (Self Directed Learning)
Thu	Anatomy	Physiology			Biochemistry	SDL (Self Directed Learning)
Fri	Behavioral Sciences 08:00-08:45 Islamic / Pak Studies 08:45-09:30	Islamic / Pak Studies 08:45-09:30	09:30-10:30	10:30-11:15	11:15-12:00	Off
	Anatomy		Physiology	Physiology	Biochemistry	
Sat	Anatomy		Physiology		Biochemistry	SDL (Self Directed Learning)

1st Year MBBS			
Session:	36 Weeks		
	Duration	Test	
First Term:	9 Weeks	1 Week	
Second Term:	9 Weeks	1 Week	
Third Term:	9 Weeks	1 Week	
Send Up:	6 Weeks		