

CURRICULUM OF PHYSIOLOGY

MBBS COURSE

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INTRODUCTION

The basic sciences subject will be covered during first and second year. Physiology is taught with its clinical application and use in clinical subjects. Due to nature of this subject educational strategies of diverse approaches are employed. Educational resources like videos, power lab, manikins, models, microscopy slides, books and journals are used to learn this diverse subject. Early clinical exposure is used for clinical application of physiology.

First year and second year are divided in three educational terms which conclude at with formative assessment test. End of year is University exam for summative assessment.

EDUCATIONAL HOURS

Year	Theory	Practical	Total
1st year	150 hours (100 Lecture, 50 SGD / PBL)	150 hours	300
2nd year	150 hours (100 Lecture, 50 SGD / PBL)	150 hours	300
Total	300 hours in 36 weeks/year	300 hours	600 hours
Strategy	Lectures Problem based learning Small group discussion Case based discussion	Laboratory session Microscopy sessions Clinical sessions Audio video sessions	

LEARNING OUTCOMES

AT THE END OF CURRICULUM 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.

EDUCATION STRATEGIES

The educational strategies in this curriculum are multiple and aligned with domain of learning and according to the desired outcome

Didactic lectures

One-third of the curriculum will be delivered in a traditional didactic format including PowerPoint presentations and case discussions. Didactic education is considered to be a one-way transmission of material from teacher to learner, we cannot overlook the possibility of meaningful interaction between experts and learners during live lectures. This type of interaction, which allows for immediate clarification of concepts and extension of knowledge, may be particularly important for novice learners who have relatively little exposure to the subject matter, such as our study population.

Problem based learning

A lot of emphasis is on case based discussion. Problem-based learning (PBL) is complex and heterogeneous. A wide variety of educational methods are referred as PBL. These include Lecture-based case, Case based lecture, Case based discussions, Problem or inquiry based and Closed loop or reiterative. Incorporation of case based discussion in teaching enhances the critical thinking and problem-solving skills. It also helps in developing a broader prospective of clinical case scenarios.

Small Group Discussion

Small group discussion provides a unique environment to achieve high standards in medical education. Activation of prior knowledge, exchange of ideas, and engagement at a higher cognitive level are assumed to result in deeper learning and better academic achievements by students.

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.

Clinical exam and OSCE

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.

Viva Voce

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

Practical

Practical test are used for assessment of knowledge and psychomotor skills.

Assignments

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

INTERNAL ASSESSMENT

- i. The weightage of internal assessment shall be 10% of totals marks.
- ii. Continuous internal assessment shall consist of evaluation at the end of each assignments, e.g. practical, class tests etc., attitudinal assessment from educational supervisors.
- iii. 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.
- iv. 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.
- v. Proper record of continuous internal assessment shall be maintained.

LEARNING RESOURCES

The department of physiology 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
- Physiology Lab
- 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.

CONTENTS MODULES

S.No	Topic
1	Module 1 Basic and Cell Physiology
2	Module 2 Blood
3	Module 3 Nerve and Muscle
4	Module 4 Cardiovascular system
5	Module 5 Respiratory system
6	Module 6 Skin and body temperature
7	Module 7 Human responses in varied environments
8	Module 8 Body fluids and kidney
9	Module 9 Nervous system
10	Module 10 Endocrine system
11	Module 11 Gastrointestinal system
12	Module 12 Reproductive system
13	Module 13 Special senses

IMPLEMENTATION

The curriculum will be spread over 2 year with 36 working weeks each year. During this period student will be exposed to various education strategies to achieve the learning objectives.

1st Year.

In this year student will be exposed to do dissection, histology lab, Museum and early clinical exposure to develop understanding of physiology and its applied aspects.

Theory (Lecture, SGD and PBL)	Practical (Early clinical exposure, Physio-Lab, Skills Lab)
150 Hours (36 Weeks)	150 Hours

2nd Year.

In this year student will be exposed to do dissection, histology lab, Museum and early clinical exposure to develop understanding of physiology and its applied aspects.

Theory (Lecture, SGD and PBL)	Practical (Early clinical exposure, Physio-Lab, Skills Lab)
150 Hours (36 Weeks)	150 Hours

First Year			
	First term	Second term	Third term
	Homeostasis Cell Blood	Nerve & muscle Heart CVS (Partly)	CVS Respiration Skin and Temp.
Practical	<ol style="list-style-type: none"> 1. Microscope 2. Hb % 3. Haemocytometer 4. RBCS Count 5. WBCs Count 6. Platelets count 7. DLC 	<ol style="list-style-type: none"> 1. BT, CT 2. Heamatocrit 3. ESR 4. Cutaneous circulation 5. Blood groups 6. Osmotic Fragility 7. RBC indices 8. Body Temp 9. CPR 	<ol style="list-style-type: none"> 1. Respiratory system 2. Lung volumes & capacities 3. Chest morements 4. Heart sounds 5. Pulses (JVP) 6. Blood pressure 7. ECG
Assessment	Monthly class Tests(3) SEQs +MCQs+ Viva 1st TERM SEQs +MCQs + Viva +OSPE, Practical	Monthly Test of Each complete unit (3) 2nd TERM SEQs, MCQs + Viva. OSPE, Practical	Monthly Test of Each Unit (3) 3rd TERM SEQs + MCQs

Send-Up = Complete course Outline

Internal assessment (total marks obtained in all tests = 100%) Taken as 20% as per rule of UHS

Second Year			
	First term	Second term	Third term
	GIT Sensory system Endocrinology	Motor System Automatic NS Special senses	Kidney Reproduction
Practical	<ol style="list-style-type: none"> 1st cranial Nerve 3rd, 4th, 6th Gial nerves 7th cranial N 9th, 10th, cranial nerve 11, 12 cranial nerve Sensory system Motor system 	<ol style="list-style-type: none"> Superficial Reflexes Deep Reflexes Cerebellar functions Perimetry Visual actuity Accommodation Light Reflex 	<ol style="list-style-type: none"> Ophthalmoscopy Color Vision Hearing Test Taste test Specific gravity of urine Pregnancy Test Research article study
Assessment	Monthly Test for each unit (3) 1st TERM Paper SEQs+ MCQs + Viva OSPE/ Practicals	Monthly test for each unit (3) 2nd TERM SEQ. MCQ + Viva +OSPE/ practical	Monthly Test for each unit (2) 3rd TERM SEQs + MCQs +Viva +OSPE/ Practical

Send-Up = Complete course Outline

Internal assessment (total marks obtained in all tests = 100%) Taken as 20% as per rule of UHS

PROGRAMME EVALUATION

Purpose of Evaluation

The major goals of the evaluation are to provide information that the students can use to achieve curricular objectives and that the faculty can use to monitor quality of and improve curriculum.

Design of Evaluation

The evaluation design as only posttest.

Users of evaluation: students, curriculum faculty, Principal Office

Resources: Curriculum faculty and departmental secretaries. No additional funding

Evaluation question:

- What percentage of students achieved 75% mandatory attendance?
- What percentage of students achieved pass marks in university exam?
- What are the strengths of the curriculum? What are the weaknesses? How can the curriculum can be improved?

Because of limited resources, the evaluation was kept simple. Data Collection was integrated into the curriculum schedule. The major goals of the evaluation are to provide information that the students can use to achieve curricular objectives and that the faculty can use to monitor quality of and improve curriculum. The evaluation design as only posttest.

End of curriculum evaluation form:

This will be filled by students and faculty members for evaluation of adequacy with each content was covered, whether they would recommend the curriculum to others and written comments on curriculum strengths, weaknesses and suggestions for improvements.

Annual Report:

Based on evaluation of the educational programe report will be generated annually and submitted to Medical Educational Department.

MBBS FIRST YEAR PROFESSIONAL EXAMINATION (PART-1)

TABLE OF SPECIFICATION (TOS)

Topic / Chapter	No. of MCQs	No. of SEQs
Basic and Cell Physiology	02	01
Blood	09	02
Nerve and Muscle	09	02
Nerve and Muscle Temperature Regulation	02	0.5
Cardiovascular System	14	02
Respiratory System	07	01
Human Responses in Varied Environments	02	0.5
Total	45	09

MBBS FIRST PROFESSIONAL (PART-1)
Objectively Structured Performance Evaluation (OSPE)

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

MBBS FIRST YEAR PROFESSIONAL EXAMINATION (PART-2)

TABLE OF SPECIFICATION (TOS)

Topic / Chapter	No. of MCQs	No. of SEQs
Kidney and body fluids	08	02
Nervous system	12	02
Special system	06	01
Endocrines	08	02
Reproduction	06	01
GIT	05	01
Total	45	09

MBBS FIRST PROFESSIONAL (PART-2)
Objectively Structured Performance Evaluation (OSPE)

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

Contents	Objectives	Domain	Strategy	Assessment
Module 1: Basic and Cell Physiology	<ul style="list-style-type: none"> • Understand functional organization of human body • Describe homeostasis I control systems in the body. • Describe structure, functions of cell membrane and its transport mechanisms • List cell organelles and describe their functions • Understand basic concepts about DNA and RNA 	<p>C3 C3 C3 C3 C3</p>	<p>SGD/LEC SGD/PBL SGD/LEC SGD/LEC SGD/PBL</p>	<p>SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ</p>

Domain	Level
Knowledge	C1 Knowledge C2 Comprehension C3 Application C4 Analysis C5 Synthesis C6 Evaluation
Psychomotor	P1 Observe P2 Practice P3 Adjust P4 Master P5 Develop P6 Construct
Affect	A1 Receiving A2 Responding A3 Valuing A4 Organization A5 Characterization