Proposed in curriculum M.Sc. (Medical Physiology)

- **Preamble**

  M.Sc medical physiology will be an intensive three years course for graduates in the biological sciences, which should facilitate them for teaching and research in health education sciences.

- **Duration**

  Full time three years course.

- **Eligibility**

  Any of the following bachelor degree passing with not less than II class

  - B.Sc graduates of biological Sciences.
  - B.Sc. Zoology/Microbiology/Botany/Physiology

  Other health sciences

  - BHMS
  - BAMS
  - B.Vsc

LEARNING OBJECTIVES

1) At the end of training course a P.G. student should have thorough knowledge of the body with respect to.

1) **Cognitive domain**

   All the systems of the body should be studied with respect to:

   a) Historical aspect
   b) Evolution and development
   c) Comparative physiology
   d) Structure-gross and electron microscopic and functions at cellular level
   e) Qualitative and quantitative aspects.
   f) Regulating mechanisms
   g) Variations in physiological and pathological conditions
   h) Applied physiology
   i) Recent advances

2) **<u>Psychomotor Domain</u>**

   P.G. students should be able-

   a) To perform human and animal (mammalian, amphibian) experiments. Hematology, Experiments based on biophysical principles.

b) To acquire history taking and clinical examination skills.

3) **Affective domain**:

a) The P.G. students should develop communication skills to interact with students, colleagues, superiors and other staff members.

b) They should be able to work as a member of a team to carry out teaching as well as research activities

c) They should have right attitude toward teaching profession.

Course Content

Ist Year

- Student should attend all UG lectures in Physiology
- Student should perform all UG practicals .
- Attend all demonstrations
- Attend seminar and present seminar as per the schedule.
- Visit to library & get acquainted with scientific journals
- Review of literature to choose topic for the dissertation & it submission in consultation of respective PG guide.
- Carryout research work.

IInd Year

- attend UG lectures of selected topics in anatomy & Biochemistry
- To perform amphibian, mammalian & hematological PG practicals.
- continue dissertation
- attend seminars present seminars as per schedule.

IIIrd Year

- Completion & submission of dissertation 6 months before the examination.
- To teach selected UG practicals to the students in presence of senior faculty.
- To conduct microteaching session to the Ist year student in presence of senior faculty

Evaluation:-

Theory Paper

Paper – I

Systemic physiology which includes Blood, CVS,RS and excretory.

3 hours duration,100marks

Four question 25 marks each

Paper II

3 hours duration 100 marks

Systemic physiology which includes CNS, ANS, special senses Endocrinology reproduction & family planning

Four questions 25 marks each

Paper III

General Physiology, History aspects, Comparative Physiology, Environmental physiology

3 hours duration,100marks

Four question 25 marks each

Paper IV

Physiological chemistry, Digestion metabolism

PH regulation, nutrition and Recent advances

3 hours duration, 100marks

Four question 25 marks each

A) Theory Topics :

In Addition to U.G. Syllabus.

1) General Physiology :
   - Biological membranes with details of membrane receptors.
   - Physiology of growth & senescence.
2) Environmental Physiology :
   - Physiology of deep sea diving.
   - Space physiology
   - High altitude physiology.
   - Temp. regulation –Hypothermia, Hyperthermia.
3) Nerve:
   - Experimental techniques to study bioelectrical phenomena (Voltage clamp technique, cathode ray oscilloscope, S.D. Curve, nerve-conduction studies)

4) Muscle:
   - E.M.G. details.
   - Smooth muscle.
   - Pathopahysiology of muscle disorders.
5) Blood :
   - Immunity – details.
   - Plasmin System
   - Tissue typing
   - Blood Bank: - Blood Components, etc.
6) Cardio Vascular System:
   - Echocardiography & vector cardiography
   - Stress test.
   - Cardiac catheterisation & other invasive procedures.
   - Flowmeters & Colour Doppler studies.
7) Respiratory System:
   - Lung function tests-details.
   - Blood Gas analysis.
   - Hyperberic Oxygen
8) Endocrines :
   - Radio immuno assay:
9) Reproductive System :
   - Invitro Fertilization.
   - Contraceptives – details.
   - Neonatal & Foetal physiology.
10) Alimentry System:
   - Gastro intestinal hormones – details
   - Gastro intestinal motility – details
   - Absorption of nutrients.
   - Study of Recent techniques to study GI functions & diseases.
   - Endoscopy etc.
11) Renal Physiology :
   - Artificial Kidney.
   - Acid – base balance – details.
   - Cystometry.
12) Central Nervous System :
   - Higher function.

(Speech, Memory, Learning. Behavioral physiology, Sleep &Wakefulness)

- Voluntary movements.
- Details of the following topics covering physiological anatomy, connection- Intrinsic, Extrinsic, Methods of study Of functions with diagnostic techniques, Functions.

  Details of methods of study of brain function.

  i) Cerebral Cortex
  ii) Basal ganglia
  iii) Cerebellum
  iv) Reticular formation
  v) Thalamus
  vi) Hypothalamus
  vii) A.N.S.
  viii) Limbic System

13) Special Senses
    - Audiometry.
    - Retinoscopy, Fundoscopy,
    - Electrophysiology of retina, cochlea.
    - and BAEP studies
14) Exercise Physiology:
    - Concept of health fitness
    - Physical fitness, its components & evaluation.
    - Adaptations due to prolonged conditioning.
15) Nutrition :
    - Relationship of diet & diseases.

PRACTICALS:

In Addition to U.G. Syllabus

Mammalian experiments:

1) Perfusion of mammalian heart.
   *Effects of Various factors.
2) Recording of mammalian smooth muscle activities & effects of various factors.

   Hematology practices

   1) Total platelet count.
   2) Reticulocyte count.
   3) Absolute eosinophil count.

II. Teaching Learning Methods.

The teaching learning activities would consist of

1) Attending U.G. lectures.
2) Attending P.G. lectures.
3) Microteaching sessions.
4) Journal clubs moderated by teachers
5) Seminars, symposia, panel discussion of suitable topics moderated by teachers.
6) Lectures & practicals prepared & presented by students under supervision.
7) Attend & participate in conferences, workshops & share knowledge & experiences with others.
8) Visits to various clinical departments to gain the knowledge of various techniques used to study the functions of various systems.

Recommended reading:

Textbooks of physiology

Gyton and Hall

Best & Taylor

S.Wright

Ganong's review of medical physiology.

Berne & Levy

Monographs, General comparative physiology(Hoar)

Text book of physiology (Bijlani)

Journal –

* Annual review of physiology
* American J.Of phy.
* Physiological review.
* Canadian J.Of Phy. & Pharmacology
* Indian J. Of Phy. & pharm & other related clinical journals

B) Practical Examination –

1) Animal experiment , graphs, case discussion for applied phy.
2) Human experiment & clinical examination Clinical tests such as EMG/NCV , ECG, EEG.
3) Haematology experiment.
4) Distribution of marks of the M.Sc (Medical Physiology)Practical
   a) Mammalian physiology - 75
   b) Amphibian physiology - 25

c) Haematology - 50
d) Human physiology - 50
e) Clinical Physiology - 50
f) Biochemistry - 25
g) Micro teaching - 50
h) Viva - 75

Total ----------
400

C) Viva Examination – Duration – 1 hour. Per student

1) General Viva - 30 minutes
2) Viva on Thesis - 20 minutes
3) Microteaching - 10 minutes