BRANCH - V M.D. (PHYSIOLOGY)

GUIDELINES FOR COMPERENCY BASED POST GRADUATE TRAINING PROGRAMME

FOR M.D. PHYSIOLOGY

Preamble

The purpose of this program is to standardize Physiology teaching at Post Graduate level through out the country so that it will benefit in achieving uniformity in undergraduate teaching as well. Accordingly the training in M.D. Physiology should be distinctive from that in M.Sc., Ph.D., (Physiology), where the approach to the subject is primarily experimental.

Programme Objectives

A candidate upon successfully qualifying in the M.D, (Physiology) examinations, should be able to:

a) Be a competent Physiologist.

b) Effectively teach undergraduate medical (and paramedical) students the basic Physiological mechanisms of human body, with reference to their implications in the pathogenesis of diseases (path physiology) and the physiological basis of their management.

c) Conduct such clinical/experimental research as would have significant bearing on human health and patient care.

d) Interact with the allied departments by rendering services in advanced laboratory investigations.

e) Acquire skills in conducting collaborative research in the field of physiology & allied sciences.

f) Must be able to demonstrate to the students how the knowledge of physiology can be used in a variety of clinical settings to solve diagnostic and therapeutic problems

Specific Learning Objective

a) Effectively teach undergraduate medical students the basic physiological mechanism of human body, with reference to their implications in the pathogenesis of diseases (pathophysiology) and their management.

b) Trained to conduct such clinical and experimental research, as would have a significant bearing on human health and patient care.

c) Encourage interaction with the allied departments by rendering services in advanced laboratory investigations and relevant expert opinion.

d) Encourage the student to participate is various workshops / seminars / journal clubs / demonstration in the allied departments, to acquire various skills for collaborative research.

e) Uphold the prestige of the discipline amongst the fraternity of doctors.

Training Period	**3 yrs**	
I yr.	Learns the basics in physiology in the Department of Physiology, Take Practical classes for U.Gs Training in teaching methods (attends a workshop), Computer training in Word Processing, Power point presentation & Internet Browsing.	
II yr.	1st 6 months: Posting in the clinical & other basic science Department-Training in Research Methodology. Choose topics for Dissertation & submits to the University.	2nd 6 months: Works on the Dissertation.
III yr.	Actively involves in U.G. teaching. Prepares for the University Examinations.	

Details of the training in the Clinical & other Basic Science Departments.

Medicine	1 Month
Anatomy	15 days
Biochemistry	15 days
Clinical pathology	15 days
Blood Bank	15 days
Endocrinology	15 days
Cardiology	15 days
Neurology	15 days
Chest Medicine	15 days
Medical Gastroenterology	15 days
Biostatistics	15 days
Physiology	6 Months

M.D. BRANCH V- PHYSIOLOGY
DETAILS OF TRAINING FIRST YEAR

I. Medical Ward Posting : 1 month.

II. Cardiology Department : 15 days.

III. Neurology Department : 15 days.

IV. Chest Medicine
(Pulmonary function Laboratory) : 15 days.

V. Medical Gasteronterology : 15 days.

VI. Department of Endocrinology : 15 days.

VII. Clinical Biochemistry : 15 days.

VIII. Haematology Department : 15 days.

IX. Blood Bank : 15 days.

X. Anatomy (Histology Laboratory) : 15 days.

XI. Department of Biostatistics and
Research Methodology : 15 days.

XII. Department of Physiology : 6 months.

Total = 12 months

The Post Graduate students shall attend the clinical postings in the forenoon session between 10 a.m. to 1 p.m. and attend to his/her Department teaching work in the afternoon session.

<u>Post-Graduate Examinations:-</u>

The Post-graduate examinations should be in 3 parts:

1) Thesis, to be submitted by each candidate at least 6 months before the date of commencement of the theory examinations.

2) Theory: There shall be four theory papers –as given separately.

3) Practicals and Viva/Oral.

Syllabus:-

(Theory Only)

I. GENERAL PHYSIOLOGY:

1) Body fluids.
2) Membrane and potentials & Action Potentials.
3) Functional Morphology of Cell.
4) Homecostaisis
5) Aging.

II. PHYSIOLOGY OF EXCITABLE TISSUE:

1) Nerve.
2) Skeletal Muscle.
3) Cardiac Muscle.
4) Smooth Muscle.

III NEURO PHYSIOLOGY:

1) Synaptic & Function Transmission.
2) Initiation of Impulses of sense organs.
3) Reflexes.
4) Cutaneious & Deep Viseral sensation.
5) Control of Posture & Equelibrium.
6) Sleep Arousal Mechanisms, the Electrical Activity of the Brain.
7) Central Regulation of Visceral Function.
8) The Autonomic Nervous System.
9) Neural Basis of Instinctual Behavior & Emotions.
10) Higher Functions of the Nervous: Conditioned Reflexes, Learning & Related Phenomena

IV SPECIAL SENSE:

1) Vision.
2) Hearing.
3) Smell & Taste.

V. BLOOD:

1) Composition and functions.
2) Structure, functions and origin of blood cells.
3) Immunity.
4) Blood groups.
5) Haemostasis.
6) Reticuloendothelial System.

VI. ENDOCRINOLOGY & METABOLISM:

1) Energy Balance, Metabolism & Nutrition.
2) The Thyroid Gland.
3) Endocrine Functions of the Pancreas & Regulation of Carbohydrate Metabolism.
4) The Adrenal Medulla & Adrenal Cortes.
5) Hormonal Control of Calcium Metabolism & the Physiology of Bone.
6) The Pituitary Gland.
7) The Gonads: Development & Function of the Reproductive System.
8) Other Endocrine Organs.

VII. GASTEROINTESTINAL FUNCTION:

1) Digestion & Absorption.
2) Origin of the Heartbeet & the Electrical Actively of the Heart.
3) The Heart as a pump.
4) Dynamics of Blood & Lymph Flow.
5) Cardiovascular Regulatory Mechanisms.
6) Circulation Through Special Regions.
7) Cardiovascular Homeostasis in Health & Diseases.

VIII. CIRCULATION:

1) Circulating Body Fluids.
2) Origin of the Heartbeet & the Electrical Actively of the Heart.
3) The Heart as a pump.
4) Dynamics of Blood & Lymph Flow.
5) Cardiovascular Regulatory Mechanisms.
6) Circulation Through Special Regions.
7) Cardiovascular Homeostasis in Health & Diseases.

IX. RESPIRATION:

1) Pulmonary Function.
2) Gas Transport between the Lungs & the Tissue.
3) Regulation of Respiration.
4) Respiratory Adjustments in Health & Diseases.
5) Environmental Physiology.

X. FORMATION & EXCRETION OF URINE:

1) Renal Function & Micturition.
2) Regulation of Extracellular Fluid Composition & Volume.

Skills to be Acquired during the Clinical Postings:-

I. MEDICAL WARD POSTINGS

1) Clinical Examination of a patient.
   Learning the pathophysiology of common medical problems.

2) Should learn to carry out all investigative procedures-
   a) Drawing of Blood.
   b) Pleural tap.
   c) Lumbar puncture.

3) Interpretation of Data-
   a) X-rays.
   b) ECG.

II. CARDIOLOGY DEPARTMENT:

Learn to operate E.C.G. apparatus, Echo, Doppler, Cardiac Monitor, Learn the methodology of Cardiac Catheterisation, Resuscitation technique, Interpretation of E.C.G. and other records.

III. NEUROLOGY DEPARTMENT:

1) Clinical Examination of patient.
2) Principles of EEC, EMG.
3) Interpretation of EEG, EMG, and other investigative Data.
4) Nerve condition.

IV. CHEST MEDICINE:

(Pulmonary function Laboratory)

Lung function tests and interpretation of results.

V. MEDICAL GASTEROENTEROENTEROLOGY

Endoscopy Technique.

VI. ENDOCRINOLOGY:

1) Clinical Examination of patients.

2) Radio Immuno Assay techniques.

VII. CLINICAL BIOCHEMISTRY:

Learn the methodology of all clinical Biochemical tests and interpretation of data.

Lectures on Metabolism of Carbohydrate – 6 hrs.
Protein and Lipids and Acid base balance

VIII. HAEMATOLOGY DEPARTMENT/CLINICAL PATHOLOGY:

All Blood investigations & interpretations.

IX. BLOOD BANK:

1) Collection, storage, transfusion of Blood.
   Transfusion Reactions - Lecture -2 hrs.

2) Blood grouping and cross matching.

X. ANATOMY:
(Histology Laboratory)

Section cutting, slide preparation, staining techniques, mounting of specimens.
Histology of normal structure.

XI. BIOSTATISTICS AND RESEARCH METHODOLOGY:

A Postgraduate candidate should undergo training in Research Methodology and gain knowledge of Biostatistics.

Study and training in the Department of Physiology.

DETAILS OF PRACTICALS

PRACTICAL

MAMMALIAN EXPERIMENTS:

I. Recording of Blood Pressure, Heart rate, Respiration in the DOG under the following:

   1. Demonstration of action of drugs.
   2. Carotid Sinus Manipulations.
   3. Effects of asphyxia.

II. Recording of myocardial contractions.
III. Recording of Intestinal movements inVitro (Jacksons enterographs)
IV. Recording of urine output and effect of drugs and chemicals.
V. Study salivary secretions.

MAMMALIAN EXPERIMENTS:
(Rabbit/ Guinea Pig /Rat)

1) In vitro experiments
    - intestinal movements
    - uterine contractions

2) Demonstration of Hypophysectomy, Thyroidectomy, adrenalectomy, pinealectomy.

3) Perfusion of mammalian heart & effects of drugs and ions.

AMPHIBIAN EXPERIMENTS: (Frog)

1) Preparation of decorticate / spinal animal.
2) Vegal stimulation & action of atrophine & nicotine.
3) Perfusion Experiments on Isolated heart.
4) Isometric contraction.
5) Velocity of nerve impulse conduction.
6) Rectus Abdominus preparation.
7) Frogs skeletal muscle contraction experiments.
8) Cardiac muscle experiments.

SLIDES:

HISTOLOGY slides of all tissues and organs of the body:

CHARTS:

Recordings for interpretation: ECG, EEG, EMG, ERG, AUDIOGRAM, SPIROGRAPH, FTM, GTT, Electrophoresis, Blood Gas Analysis, Flow-Volume Curves.

HAEMATOLOGY:

Red Blood Cell count
Total White Cell count
Differential Leucocyte count
Reticulocyte count
Platelet count
Eosinophil count
Arneth index
Prothrombin time
Blood grouping
Hb% estimation

HUMAN EXPERIMENTS:

Examination of:
Respiratory system
Cardiovascular system
Nervous system

Perform or record & interpret the data or finding:

1) Autonomic Function Tests.
2) Physical Fitness.
3) ECG, EMG, EEG.
4) Spirometry.
5) Ergometry.
6) Perimetry.
7) Stethography.
8) Respiratory efficiency & endurance.
9) Recording of respiratory movements using stethograph and effects of : Hyperventilation, swallowing, speech, breath holding, exercise on Respiratory movement.

PEDAGOGY:

The teaching skills of the candidate will be assessed. The candidate will be given a topic by the 4 Examiners at the end of the first day of the practical examination for a Lecture presentation on the next day to an imaginary audience. The Examiners shall evaluate the candidates ability (Trial class room lecture for under graduate students)

PATTERN OF EXAMINATION :-

FOUR PAPERS – 100 Marks each 3 Hours duration each

Theory	**Title**	**Duration**	**Marks**
Paper -I	General Physiology, Blood Digestion and Tissues of the Body.	3 hrs	100
Paper -II	Circulation Respiration, Environmental Physiology and Excretion, Comparative Physiology	3 hrs	100 l
Paper -III	Nervous System and Special Senses.	3 hrs	100
Paper -IV	History of Medicine, Recent Advances in Clinical Physiology, Endocrinology And Reproductive Systems.	3 hrs	100
		Total	400

Distribution of Marks:

2 Essays	2 x 20 =	40 Marks
10 Short Notes	10 x 6 =	60 Marks
	Total	100 Marks

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* 30th SAB held on 20-12-2005 - March 2006 Examination onwards
** 32th SAB held on 21-12-2006 - March 2008 Examination onwards.

Practical Examination

Day - 1

	Marks	**Duration**
Mammalian (Dog) Graphs.	20	1 hr.
Mammalian Isolated Organ	35	1 hr.
Heart Amphibian or Skeletal Muscle	35	1 hr.
Haematology.	35	1 hr.

Day- 2

Clinical Examinations	40	1 hr
Clinical (Human) Experiments.	35	1 hr
Total	**200**	

Pedagogy	50	20 min.
Orals	50	45 min.

NOTE: No. of candidates to be examined 4 per day for Practical/ Viva.

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DISSERTATION : **APPROVED / NOT APPROVED**

(No Marks)

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****MARKS QUALIFYING FOR A PASS**	**MAXIMUM MARKS**	**QUALIFYING FOR A PASS 50% MARKS**
Theory Examination	400	200
Practical Examination	200	100
Oral / Viva & Pedagogy (50+50)	100	No Minimum
Aggregate	700	350

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** **33th SAB held on 20-06-2007 - March 2008 Examination onwards.**

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