

PHYSIOLOGY & BIOCHEMISTRY

A. Subject Aims:

The aims of teaching physiology to the homoeopathic medical students are:

1. As an integrated study of the body's functional systems and to utilize fundamental knowledge to build a better understanding of the mechanism upon which life process depends.
2. To apply this knowledge to diseased conditions which result from abnormal function of one or more of the control system.
3. Proceed to undergo higher studies.

B. Subject Objectives:

At the end of the course of physiology the students should be able to:

1. Understand normal function of human body.
2. Explain normal reactions to environment and homeostatic mechanism i.e Vital force.
3. Explain normal reproductive process.
4. Interpret normal function to understand abnormal function and structure.
5. Understand fundamental & elementary principle of human biochemistry.
6. Know all the chemical processes going on inside the body during normal health & disease.
7. To perform, understand & interpret the clinical biochemistry.
8. To handle modern biochemical appliances.
9. To correlate with the other subjects taught in this professional course and curriculum.

C. Course Composition and teaching hours:

The teaching of physiology is spread over the first year & second year of B.H.M.S course.

1. Theoretical lectures.....	200 hours.
2. Tutorials	50 hours.
3. Practical classes.....	100 hours.
4. Demonstrations.....	<u>50 hours.</u>
	400 hours.

D. Evaluation:

Throughout the two-years course, provision for continuous assessment of students' performance is recorded in pre-designed assessment Cards. This assessment is carried out item wise by the teachers of the department. Students are eligible to sit for the 1st. Professional Examination on satisfactory completion of the items to be assessed.

E. Evaluation in the First Professional BHMS Examination:

Theory (MCQ25%+ SAQ 75%).....	200 marks
Two papers (100+100)	
Practical	200 marks
[2 experiments- $40 \times 2 = 80$	
Instruments (spotting)-	40
Table viva	20
Practical Note Book	10
Oral/viva-voce	<u>50]</u>
	400 marks

PHYSIOLOGY & BIOCHEMISTRY

Paper-I

Hom - 104A

Detailed Course Contents:

1. General Physiology:

- * Introduction to human physiology-
Cell structure, Tissue
Membrane transport.

2. Blood:

- * Composition; functions in general (of blood).
- * Plasma proteins-- its origin, composition, functions and properties.
- * Erythrocytes-- morphology, development, functions, fate.
- * Leucocytes-- morphology, classification, development, function, properties.
- * Thrombocytes-- morphology, development, functions.
- * Haemoglobin-- synthesis, structure, function, fate.
- * Coagulation of blood—factor, mechanism, anticoagulants, bleeding disorder.
- * Blood groups-- ABO system, Rh. system, blood transfusion & its hazards.
- * Anaemia-- classification and detection.
- * Lymph-- formation, circulation, functions.

3. Cardiovascular system:

- * Structure and properties of cardiac muscle.
- * Generation and conduction of cardiac impulse & ECG.

- * Events of cardiac cycle and cardiac outputs.
- * Heart rate, factors affecting heart rate.
- * Haemodynamics.
- * Blood pressure and its regulation.
- * Circulation of blood.
- * Blood vessels.

4. Respiratory system:

- * Anatomy of respiratory organs.
- * Pulmonary circulation.
- * Mechanism of respiration
 - Pulmonary ventilation, pulmonary volumes, capacities.
 - Compliance, alveolar ventilation.
- * Oxygen transport, oxygen carriage.
- * Carbondioxide transport.
- * Regulation of respiration-- nervous and chemical.
- * Hypoxia-- classification, apnoea, hypercapnoea, cyanosis.
- * Artificial respiration.
- * Breathing sounds.

5. Digestive system:

- * Introduction to alimentary system, structure, function and movement of gut.
- * Digestive juices (salivary, gastric, pancreatic juices and bile)-- their composition, character, secretion and regulation of secretion, functions.
- * Liver and its digestive function.
- * Steps of digestion of carbohydrate, Fat & Protein.
- * Absorption of nutrients and end products of digestion carbohydrates, fats and protein.

BIOCHEMISTRY

6. Elementary biochemistry:

- * Acids, bases and indicator, Solution, Normality, Molarity
- * pH, buffers, indicators.
- * Osmosis, diffusion, surface tension, osmotic pressure,
- * Chemistry of carbohydrates, fats and proteins.
- * Enzymes, Coenzymes.
- * Digestion & absorption of carbohydrate, fats and proteins.

7. Metabolism:

- * General metabolism, energy consideration.
- * Biological oxidation.
- * Energy molecules.
- * Metabolism of carbohydrates, fats and proteins.
- * Metabolic function of liver.
- * Inorganic metabolism— calcium, iron, iodine.

8. Biochemistry of blood:

- * Plasma proteins.
- * Haemoglobin.
- * Acidosis & alkalosis.
- * Body fluids, electrolytes, water & acid-base balance.

9. Nutrition:

- * General consideration.
- * Vitamins.
- * Dietary balance.

PHYSIOLOGY & BIOCHEMISTRY

Paper-II

Hom - 104B

Detailed Course Contents:

10. Urinary system:

- * Structure and functions of kidney, renal circulation.
- * Formation of urine
Glomerular filtration,
Reabsorption of different components of tubular fluid,
Secretion of substances by the kidney,
Concentration of urine,
Acidification of urine,
Physiology of micturition,
Composition of normal urine,
Acid-base balance, Plasma clearance.

11. Endocrine system:

- * Introduction to different endocrine glands, hypothalamo-hypophyseal axis, Emergency & Life Saving hormone .
- * Pituitary gland- anterior and posterior pituitary, its hormones and their functions, disorder of pituitary gland.
- * Thyroid gland
Structure, synthesis of its hormones and their functions,
Control of secretion of hormones,
Disorder of thyroid gland, thyroid function tests.
- * Parathyroid glands-
Secretion and functions of its hormones,

Calcium metabolism and tetany.

- * pancreas-
Histology, secretion and functions of its hormones,
Diabetes mellitus.
- * Adrenal glands-
Adrenal cortex-
Structure, its hormones and their functions, regulation of secretion of adrenocortical hormones, Disorder of adrenal cortex. Adrenal medulla-Structure, its hormones and their functions and regulations.

12. Reproductive system:

- * Introduction to reproductive organs.
- * Female reproductive system
Puberty, menarchae and menopause.
Structure and functions of ovary, ovarian cycle, Menstrual cycle, Functions of the ovarian hormones, Physiology of pregnancy, Placental functions, Physiology of lactation.
- * Male reproductive system-
Structure and functions of testes,
Functions of testicular hormones,
Spermatogenesis.
Semen-Character, composition, functions.

13. Nervous system:

- * Organization of the nervous system, its classification.
- * Neuron, its properties.
- * Action potential.
- * Synapses, synaptic and neuro-muscular transmission, neuro-transmitters.
- * Sensory and motor pathways.
- * Sensory mechanism-

Receptors- classification and functions of receptors.

Ascending (sensory) tracts of spinal cord.

- * Motor mechanism

Functional organization,

Descending (pyramidal and extra pyramidal) tracts of spinal cord,

Reflex actions.

- * Cerebral cortex-

Areas of cerebral cortex with functions,

Maintenance of tone and posture,

Equilibrium.

- * Cerebellum-

Functional anatomy, function.

- * Autonomic nervous system-

Origin, course, sympathetic and parasympathetic outflow.

- * CSF- Definition, Character, composition, functions, circulation.

14. Special senses:

- * Pain- Definition, Mechanism of pain, Referred pain.

- * Eye- Introduction to optical apparatus,
Visual pathway-- pathway of vision, pathway of light reflex,

Accommodation-- pathway and mechanism of accommodation, Field of vision, colour vision.

- * Ear- Physiology of hearing-- auditory apparatus, transmission of sound and mechanism of hearing, Deafness.

- * Physiology of smell and taste.

- * Physiology of touch sensation.

PRACTICAL (Physiology & Biochemistry)

Introductory class on:

1. Use of microscope.
2. Laboratory equipments.

Learning of haematological methods:

3. Preparation and staining of peripheral blood film.
4. Total count of RBC, WBC & Platelets.
5. Differential count of WBC.
6. Estimation of haemoglobin.
7. Estimation of ESR.
8. Determination of bleeding time & coagulation time.
9. Determination of PCV, MCV & MCHC.
10. Blood grouping and cross matching.
11. Estimation of blood glucose.

Experiments on human beings:

12. Measurement of normal blood pressure.
13. Auscultation of heart sound.
14. Tracing of radial pulse.
15. Tests for hearing.
16. ECG.
17. Record of body temperature.

Urine and stool examination:

18. Urine analysis-- RE/ME.
19. Stool-- RE/ME.
20. Demonstration of instruments.

PRACTICAL NOTE BOOK

The practical note book must be submitted along with the progress card during examinations for evaluation by the examiners.