

testis, spermatogenesis and its regulation, Cryptorchidism ; Female reproductive system: functions of ovary and its control, menstrual cycle: Hormonal, uterine and ovarian changes; Tests for ovulation; Physiological effects of sex hormones; Contraceptive methods for male and female; Effects of removal of gonads on physiological functions; Physiology of pregnancy, fetoplacental unit, pregnancy tests, parturition & lactation; Semen analysis; Causes and principles of management of infertility; Hormonal changes and their effects during perimenopause and menopause; Psychological and psychiatric disturbances associated with reproductive physiology.

Neurophysiology: (PY 10.1 - 10.20)**(37 hrs)**

Organization of nervous system; Sensory system: types, functions and properties of synapse, receptors, reflex; Somatic sensations & sensory tracts; Physiology of pain; Motor system: organization, motor tracts, mechanism of maintenance of tone, control of voluntary movements ; Posture and equilibrium & vestibular apparatus; Reticular activating system, Autonomic nervous system ; Spinal cord: functional organization and lesions ; Formation, circulation and function of CSF; Blood brain barrier; Neurotransmitters.

Organization, connections and functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities; Higher mental functions ; Physiology of sleep, memory, learning and speech and their disorders; EEG.

Special senses- Smell and taste sensation and their abnormalities; Functional anatomy of ear and auditory pathways & physiology of hearing, Deafness, hearing tests; Functional anatomy of eye, Image formation, Visual pathway and its lesions, Physiology of vision including acuity of vision, colour vision, field of vision, refractive errors, physiology of pupil; light reflex, accommodation reflex, dark and light adaptation; Auditory & visual evoked potentials

Integrated Physiology: (PY 11.1 - 11.14)**(6 hrs)**

Temperature regulation: mechanism, adaptation to altered temperature (heat and cold environment), mechanism of fever, cold injuries and heat stroke; Exercise- cardio-respiratory and metabolic adjustments during exercise (isotonic and isometric), exercise in heat and cold, physical training effects; Physiological consequences of sedentary lifestyle; Brain death; Physiology of Infancy*; Physiology of aging-free radicals and antioxidants*; Physiology of meditation*.

(* 'Non-core' competencies as per "Competency based Undergraduate Curriculum for the Indian Medical Graduate 2018: Medical Council of India").

PRACTICAL

The following list of practical is minimum and essential. Additional exercises can be included as and when feasible and required. All the practicals have been categorized as '**Procedures to be performed**' and '**Demonstrations**'. The procedures are to be performed by the students during practical classes to acquire skills. These would be included in the practical during University examination. Those categorized as 'Demonstrations' are to be shown to students during practical

classes. Questions based on these would be given in the form of data, charts, graphs, problems and case histories for interpretation by students during university examination.

I. Procedures to be performed by the students:

a. Haematology:

1. RBC count
2. WBC Count
3. Differential Leucocyte Count
4. Estimation of haemoglobin
5. Blood grouping
6. Bleeding time
7. Clotting time
8. Calculate RBC indices - MCV, MCH, MCHC.

b. Procedures to be performed on human subjects:

1. Mosso's ergography.
2. Recording of Blood Pressure, pulse rate at rest and effect of posture.
3. Effect of mild and moderate exercise on blood pressure, pulse rate and respiratory rate using Harvard step test.
4. Record and interpret Lead II ECG. Given a normal ECG, determine cardiac axis.
5. Spirometry – Lung volumes and capacities, MVV, Timed vital capacity.
6. Peak Expiratory Flow Rate
7. Demonstrate Basic Life Support in a simulated environment
8. Visual field by Perimetry

c. Clinical Examination:

1. Components of history taking and general physical examination
2. Examination of radial pulse
3. Examination of Cardiovascular system
4. Examination of Respiratory system
5. Examination of abdomen
6. Examination of Higher mental functions
7. Examination of Sensory system
8. Examination of Motor system including reflexes.
9. Examination of Cranial Nerves

II. Demonstrations:

I. Haematology:

1. Erythrocyte sedimentation rate
2. Haematocrit
3. Reticulocyte count
4. Platelet count
5. Osmotic fragility

2. Record Arterial pulse tracing using finger plethysmography*
3. Stethography
4. Tests of cardiovascular autonomic functions*

(* 'Non-core' competencies as per "Competency based Undergraduate Curriculum for the Indian Medical Graduate 2018: Medical Council of India")

III. Interpretation- charts: clinical case histories, graphs, charts, problems

(Suggested topics for preparation of these are given under ANNEXURE I. However, many more could be developed which is under discretion of each institution)

Chart also includes - Interpret growth chart*, Interpret anthropometric assessment of infants*: (*these two charts are 'Non-core' competencies as per "Competency based Undergraduate Curriculum for the Indian Medical Graduate 2018: Medical Council of India")

IV. Computer assisted learning:

(i) Amphibian nerve - muscle experiments and interpretation of graphs

List of graphs on nerve-muscle experiments:

- Simple muscle twitch
- Effect of various strengths of stimuli on Simple muscle twitch
- Effect of changes in temperature on Simple muscle twitch
- Effect of two successive stimuli on muscle contraction
- Effect of multiple successive stimuli (treppe, clonus, tetanus)
- Study of fatigue in skeletal muscle
- Velocity of nerve conduction
- Effect of load on muscle
- Measurement of isometric contractions using nerve muscle preparation

(ii) Amphibian cardiac experiments and interpretation of graphs

List of graphs on cardiac experiments:

- Normal cardiogram
- Effect of temperature on frog heart
- Effect of Stannius ligatures
- Properties of cardiac muscle – all or none law, staircase effect, refractory period in a beating heart (extrasystole and compensatory pause), refractory period in a quiescent heart
- Effect of vagus on frog's heart
- Action of drugs on vagus (nicotine and atropine)
- Perfusion of isolated heart and effect of ions (NaCl, KCl, CaCl₂)
- Perfusion of isolated heart and effect of drugs (adrenaline, acetyl choline, atropine followed by Ach)