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| **SYLLABUS FOR FIRST PROFESSIONAL M.B.B.S. IN PHYSIOLOGY****In accordance with** **COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE 2018****Teaching Schedule****Lecture : 240 hrs.****Practical : 160 hrs.****Tutorial including Group discussion, Seminar, Items : 160 hrs.** **TOTAL : 560 hrs.****Total No. of weeks : 40 weeks****Per week allotment : 14 hrs.****Lecture : 06 hrs.****Practicals : 04 hrs.****Tutorials etc. : 04 hrs.** **Small Group Discussion****DOAP Sessions (Demonstration-Observation-Assistance-Performance)****Skill Assessment- Written/Practical/Viva** |
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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| **GERERAL PHYSIOLOGY****Number of competencies: (09)** |  |
| PY1.1 | Describe the structure and functions of a mammalian cell | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY1.2 | Describe and discuss the principles of homeostasis | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY1.3 | Describe intercellular communication | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY1.4 | Describe apoptosis – programmed cell death | Lecture, Small group discussion | Written/Viva voce | Pathology |  |
| PY1.5 | Describe and discuss transport mechanisms across cell membranes | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY1.6 | Describe the fluid compartments of the body, its ionic composition & measurements | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |
| PY1.7 | Describe the concept of pH & Buffer systems in the body | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |
| PY1.8 | Describe and discuss the molecular basis of resting membrane potential and action potential in excitable tissue | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY1.9 | Demonstrate the ability to describe and discuss the methods used to demonstrate the functions of the cells and its products, its communications and their applications in Clinical care and research. | Lecture, Small group discussion | Written/Viva voce |  |  |
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| **Number** |  **HEMATOLOGY** **The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY2.1 | Describe the composition and functions of blood components | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY2.2 | Discuss the origin, forms, variations and functions of plasma proteins | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |
| PY2.3 | Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |
| PY2.4 | Describe RBC formation (erythropoiesis & its regulation) and its functions | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY2.5 | Describe different types of anaemias & Jaundice | Lecture, Small group discussion | Written/Viva voce | Pathology | Biochemistry |
| PY2.6 | Describe WBC formation (granulopoiesis) and its regulation | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY2.7 | Describe the formation of platelets, functions and variations. | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY2.8 | Describe the physiological basis of hemostasis and, anticoagulants. Describe bleeding & clotting disorders (Hemophilia, purpura) | Lecture, Small group discussion | Written/Viva voce | Pathology |  |
| PY2.9 | Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion | Lecture, Small group discussion, ECE- Visit to blood bank | Written/Viva voce | Pathology |  |
| PY2.10 | Define and classify different types of immunity. Describe the development of immunity and its regulation | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY2.11 | Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT | DOAP sessions | Practical/OSPE/Viva voce | Pathology |  |
| PY2.12 | Describe test for ESR, Osmotic fragility, Hematocrit. Note the findings and interpret the test results etc | Demonstration | Written /Viva voce | Pathology |  |

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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY2.13 | Describe steps for reticulocyte and platelet count**NERVE-MUSCLE PHYSIOLOGY** | Demonstration sessions | Written /Viva voce | Pathology |  |
| PY3.1 | Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY3.2 | Describe the types, functions & properties of nerve fibers | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY3.3 | Describe the degeneration and regeneration in peripheral nerves | Lecture, Small group discussion | Written/Viva voce | General Medicine |  |
| PY3.4 | Describe the structure of neuro-muscular junction and transmission of impulses | Lecture, Small group discussion | Written/Viva voce | Anaesthesiology |  |
| PY3.5 | Discuss the action of neuro-muscular blocking agents | Lecture, Small group discussion | Written/Viva voce | Anaesthesiology, Pharmacology |  |
| PY3.6 | Describe the pathophysiology of Myasthenia gravis | Lecture, Small group discussion | Written/Viva voce | Pathology |  |
| PY3.7 | Describe the different types of muscle fibres and their structure | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY3.8 | Describe action potential and its properties in different muscle types (skeletal & smooth) | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY3.9 | Describe the molecular basis of muscle contraction in skeletal and in smooth muscles | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY3.10 | Describe the mode of muscle contraction (isometric and isotonic) | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY3.11 | Explain energy source and muscle metabolism | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |
| Number | COMPETENCYThe student should be able to: | Suggested Teaching Learning method | Suggested Assessment method | Vertical Integration | Horizontal Integration |
| PY3.12 | Explain the gradation of muscular activity  | Lecture, Small group discussion | Written/Viva voce | General Medicine |  |
| PY3.13 | Describe muscular dystrophy: myopathies | Lecture, Small group discussion | Written/Viva voce | General Medicine | Human Anatomy |
| PY3.14 | Perform Ergography | DOAP sessions | Practical/OSPE/Viva voce |  |  |
| PY3.15 | Demonstrate effect of mild, moderate and severe exercise and record changes in cardiorespiratory parameters | DOAP sessions | Practical/OSPE/Viva voce |  |  |
| PY3.16 | Demonstrate Harvard Step test and describe the impact on induced physiologic parameters in a simulated environment | DOAP sessions | Practical/OSPE/Viva voce |  |  |
| PY3.17 | Describe Strength-duration curve | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY3.18 | Observe with Computer assisted learning (i) amphibian nerve - muscle experiments (ii) amphibian cardiac experiments**GASRTO-INTESTINAL PHYSIOLOGY** | Demonstration, Computer assisted learning methods | Practical / Viva voce |  |  |
| PY4.1 | Describe the structure and functions of digestive system | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY4.2 | Describe the composition, mechanism of secretion, functions, and regulation of saliva, gastric, pancreatic, intestinal juices and bile secretion | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |
| PY4.3 | Describe GIT movements, regulation and functions. Describe defecation reflex. Explain role of dietary fibre. | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY4.4 | Describe the physiology of digestion and absorption of nutrients | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |

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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY4.5 | Describe the source of GIT hormones, their regulation and functions | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY4.6 | Describe the Gut-Brain Axis | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY4.7 | Describe & discuss the structure and functions of liver and gall bladder | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |
| PY4.8 | Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests | Lecture, Small group discussion, Demonstration Esophageal Manometry & endoscopy | Written/Viva voce |  | Biochemistry |
| PY4.9 | Discuss the physiology aspects of: peptic ulcer, gastro- oesophageal reflux disease, vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease | Lecture, Small group discussion | Written/Viva voce | General Medicine | Biochemistry |
| PY4.10 | Demonstrate the correct clinical examination of the abdomen in a normal volunteer or simulated environment**CARDIO-VASCULAR PHYSIOLOGY** | DOAP session | Skill assessment/ Viva voce/OSCE |  |  |
| PY5.1 | Describe the functional anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system. | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY5.2 | Describe the properties of cardiac muscle including its morphology, electrical, mechanical and metabolic functions | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY5.3 | Discuss the events occurring during the cardiac cycle | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY5.4 | Describe generation, conduction of cardiac impulse | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY5.5 | Describe the physiology of electrocardiogram (E.C.G), its applications and the cardiac axis | Lecture, Small group discussion | Written/Viva voce | General Medicine |  |

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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY5.6 | Describe abnormal ECG, arrythmias, heart block and myocardial Infarction | Lecture, Small group discussion | Written/Viva voce | General Medicine | Human Anatomy |
| PY5.7 | Describe and discuss haemodynamics of circulatory system | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY5.8 | Describe and discuss local and systemic cardiovascular regulatory mechanisms | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY5.9 | Describe the factors affecting heart rate, regulation of cardiac output & blood pressure | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY5.10 | Describe & discuss regional circulation including microcirculation, lymphatic circulation, coronary, cerebral, capillary, skin, foetal, pulmonary and splanchnic circulation | Lecture, Small group discussion | Written/Viva voce | General Medicine |  |
| PY5.11 | Describe the patho-physiology of shock, syncope and heart failure | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY5.12 | Record blood pressure & pulse at rest and in different grades of exercise and postures in a volunteer or simulated environment | DOAP sessions | Practical/OSPE/ Viva voce |  |  |
| PY5.13 | Record and interpret normal ECG in a volunteer or simulated environment | DOAP sessions | Practical/OSPE/ Viva voce | General Medicine |  |
| PY5.14 | Observe cardiovascular autonomic function tests in a volunteer or simulated environment | DOAP sessions | Skill assessment/ Viva voce |  |  |
| PY5.15 | Demonstrate the correct clinical examination of the cardiovascular system in a normal volunteer or simulated environment | DOAP sessions | Practical/OSPE/ Viva voce |  |  |
| PY5.16 | Record Arterial pulse tracing using finger plethysmography in a volunteer or simulated environment | DOAP sessions, Computer assisted learning methods | Practical/OSPE/ Viva voce | General Medicine |  |

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| **Number** |  **RESPIRATORY PHYSIOLOGY****COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY6.1 | Describe the functional anatomy of respiratory tract | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY6.2 | Describe the mechanics of normal respiration, pressure changes during ventilation, lung volume and capacities, alveolar surface tension, compliance, airway resistance, ventilation, V/P ratio, diffusion capacity of lungs | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY6.3 | Describe and discuss the transport of respiratory gases: Oxygen and Carbon dioxide | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY6.4 | Describe and discuss the physiology of high altitude and deep sea diving | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY6.5 | Describe and discuss the principles of artificial respiration, oxygen therapy, acclimatization and decompression sickness. | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY6.6 | Describe and discuss the pathophysiology of dyspnoea, hypoxia, cyanosis asphyxia; drowning, periodic breathing | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY6.7 | Describe and discuss lung function tests & their clinical significance | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY6.8 | Demonstrate the correct technique to perform & interpret Spirometry | DOAP sessions | Skill assessment/ Viva voce | Respiratory Medicine |  |
| PY6.9 | Demonstrate the correct clinical examination of the respiratory system in a normal volunteer or simulated environment | DOAP sessions | Skill assessment/ Viva voce/OSCE |  |  |
| PY6.10 | Demonstrate the correct technique to perform measurement of peak expiratory flow rate in a normal volunteer or simulated environment**RENAL PHYSIOLOGY** | DOAP sessions | Practical/OSPE/ Viva voce |  |  |
| PY7.1 | Describe structure and function of kidney | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY7.2 | Describe the structure and functions of juxta glomerular apparatus and role of renin-angiotensin system | Lecture, Small group discussion | Written/Viva voce |  |  |

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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY7.3 | Describe the mechanism of urine formation involving processes of filtration, tubular reabsorption & secretion; concentration and diluting mechanism | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY7.4 | Describe & discuss the significance & implication of Renal clearance | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY7.5 | Describe the renal regulation of fluid and electrolytes & acid-base balance | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY7.6 | Describe the innervations of urinary bladder, physiology of micturition and its abnormalities | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY7.7 | Describe artificial kidney, dialysis and renal transplantation | Lecture, Small group discussion | Written/Viva voce | General Medicine |  |
| PY7.8 | Describe & discuss Renal Function Tests | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |
| PY7.9 | Describe cystometry and discuss the normal cystometrogram**ENDOCRINE PHYSIOLOGY** | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY8.1 | Describe the physiology of bone and calcium metabolism | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY8.2 | Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas and hypothalamus | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY8.3 | Describe the physiology of Thymus & Pineal Gland | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY8.4 | Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas | Lecture, Small group discussion | Written/Viva voce |  | Biochemistry |

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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY8.5 | Describe the metabolic and endocrine consequences of obesity & metabolic syndrome, Stress response. Outline the psychiatry component pertaining to metabolic syndrome. | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY8.6 | Describe & differentiate the mechanism of action of steroid, protein and amine hormones**REPRODUCTIVE PHYSIOLOGY** | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY9.1 | Describe and discuss sex determination; sex differentiation and their abnormities and outline psychiatry and practical implication of sex determination. | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY9.2 | Describe and discuss puberty: onset, progression, stages; early and delayed puberty and outline adolescent clinical and psychological association. | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY9.3 | Describe male reproductive system: functions of testis and control of spermatogenesis & factors modifying it and outline its association with psychiatric illness | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY9.4 | Describe female reproductive system: (a) functions of ovary and its control; (b) menstrual cycle - hormonal, uterine and ovarian changes | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY9.5 | Describe and discuss the physiological effects of sex hormones | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY9.6 | Enumerate the contraceptive methods for male and female. Discuss their advantages & disadvantages | Lecture, Small group discussion | Written/Viva voce | Obstetrics & Gynaecology, Community Medicine |  |
| PY9.7 | Describe and discuss the effects of removal of gonads on physiological functions | Lecture, Small group discussion | Written/Viva voce |  |  |

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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY9.8 | Describe and discuss the physiology of pregnancy, parturition & lactation and outline the psychology and psychiatry-disorders associated with it. | Lecture, Small group discussion | Written/Viva voce | Obstetrics & Gynaecology |  |
| PY9.9 | Interpret a normal semen analysis report including (a) sperm count,(b) sperm morphology and (c) sperm motility, as per WHO guidelines and discuss the results | Lecture, Small group discussion | OSPE/Viva voce |  |  |
| PY9.10 | Discuss the physiological basis of various pregnancy tests | Lecture, Small group discussion | Written/Viva voce | Obstetrics & Gynaecology |  |
| PY9.11 | Discuss the hormonal changes and their effects during perimenopause and menopause | Lecture, Small group discussion | Written/Viva voce | Obstetrics & Gynaecology |  |
| PY9.12 | Discuss the common causes of infertility in a couple and role of IVF in managing a case of infertility.**NERVOUS SYSTEM PHYSIOLOGY** | Lecture, Small group discussion | Written/Viva voce | Obstetrics & Gynaecology |  |
| PY10.1 | Describe and discuss the organization of nervous system | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY10.2 | Describe and discuss the functions and properties of synapse, reflex, receptors | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY10.3 | Describe and discuss somatic sensations & sensory tracts | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY10.4 | Describe and discuss motor tracts, mechanism of maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY10.5 | Describe and discuss structure and functions of reticular activating system, autonomic nervous system (ANS) | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |
| PY10.6 | Describe and discuss Spinal cord, its functions, lesion & sensory disturbances | Lecture, Small group discussion | Written/Viva voce |  | Human Anatomy |

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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY10.7 | Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities | Lecture, Small group discussion | Written/Viva voce | Psychiatry | Human Anatomy |
| PY10.8 | Describe and discuss behavioural and EEG characteristics during sleep and mechanism responsible for its production | Lecture, Small group discussion | Written/Viva voce | Psychiatry |  |
| PY10.9 | Describe and discuss the physiological basis of memory, learning and speech | Lecture, Small group discussion | Written/Viva voce | Psychiatry |  |
| PY10.10 | Describe and discuss chemical transmission in the nervous system. (Outline the psychiatry element). | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY10.11 | Demonstrate the correct clinical examination of the nervous system: Higher functions, sensory system, motor system, reflexes, cranial nerves in a normal volunteer or simulated environment | DOAP sessions | Skill assessment/ Viva voce/OSCE |  | Human Anatomy |
| PY10.12 | Identify normal EEG forms | Small group teaching | OSPE/Viva voce | Psychiatry |  |
| PY10.13 | Describe and discuss perception of smell and taste sensation | Lecture, Small group discussion | Written/Viva voce | ENT |  |
| PY10.14 | Describe and discuss patho-physiology of altered smell and taste sensation | Lecture, Small group discussion | Written/Viva voce | ENT |  |
| PY10.15 | Describe and discuss functional anatomy of ear and auditory pathways & physiology of hearing | Lecture, Small group discussion | Written/Viva voce | ENT |  |
| PY10.16 | Describe and discuss pathophysiology of deafness. Describe hearing tests | Lecture, Small group discussion | Written/Viva voce | ENT |  |
| PY10.17 | Describe and discuss functional anatomy of eye, physiology of image formation, physiology of vision including colour vision, refractive errors, colour blindness, physiology of pupil and light reflex | Lecture, Small group discussion | Written/Viva voce | Ophthalmology |  |

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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY10.18 | Describe and discuss the physiological basis of lesion in visual pathway | Lecture, Small group discussion | Written/Viva voce | Ophthalmology |  |
| PY10.19 | Describe and discuss auditory & visual evoke potentials | Lecture, Small group discussion | Written/Viva voce | Ophthalmology |  |
| PY10.20 | Demonstrate (i) Testing of visual acuity, colour and field of vision and (ii) hearing (iii) Testing for smell and (iv) taste sensation in volunteer/ simulated environment**INTEGRATED PHYSIOLOGY** | DOAP sessions | Skill assessment/ Viva voce | ENT, Ophthalmology |  |
| PY11.1 | Describe and discuss mechanism of temperature regulation | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY11.2 | Describe and discuss adaptation to altered temperature (heat and cold) | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY11.3 | Describe and discuss mechanism of fever, cold injuries and heat stroke | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY11.4 | Describe and discuss cardio-respiratory and metabolic adjustments during exercise; physical training effects | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY11.5 | Describe and discuss physiological consequences of sedentary lifestyle | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY11.6 | Describe physiology of Infancy | Lecture, Small group discussion | Written/Viva voce | Pediatrics |  |
| PY11.7 | Describe and discuss physiology of aging; free radicals and antioxidants | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY11.8 | Discuss & compare cardio-respiratory changes in exercise (isometric and isotonic) with that in the resting state and under different environmental conditions (heat and cold) | Lecture, Small group discussion | Written/Viva voce |  |  |

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| **Number** | **COMPETENCY****The student should be able to:** | **Suggested Teaching Learning method** | **Suggested Assessment method** | **Vertical Integration** | **Horizontal Integration** |
| PY11.9 | Interpret growth charts | Small group teaching | Practical/OSPE/ Viva voce | Pediatrics |  |
| PY11.10 | Interpret anthropometric assessment of infants | Small group teaching | Practical/OSPE/ Viva voce | Pediatrics |  |
| PY11.11 | Discuss the concept, criteria for diagnosis of Brain death and its implications | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY11.12 | Discuss the physiological effects of meditation | Lecture, Small group discussion | Written/Viva voce |  |  |
| PY11.13 | Obtain history and perform general examination in the volunteer / simulated environment | DOAP sessions | Skill assessment/ Viva voce |  |  |
| PY11.14 | Demonstrate Basic Life Support in a simulated environment | DOAP sessions | OSCE | General Medicine, Anaesthesiology |  |

**Practical Physiology**

**I) Haematology: 6O hrs.**

a) Compound microscope.

b) Preparation of blood film.

c) StainingwithLeishman’s stain.

d) Identification of blood cell.

e) Differential count of WBC.

0 Total count of WBC.

g) Total count of RBC.

h) Haemoglobin estimation.

i) Total count of platelets.

j) Blood grouping.

k) Bleeding time and clotting time.

I). Haemin crystal.

m) Demonstration of: PCV, ESR, Osmotic fragility, Prothrombin time.

**2) Amphibian Practicals: 2O hrs.**

a) Demonstration of instruments : Related to amphibian nerve muscle and heart experiments.

b) Demonstration of experiments:

1) Effect of single induction shock.

2) Effect of two successive stimuli.

3) Effect of repeated stimuli for genesis of clonus and tetanus.

4) Effect of temperature on simple muscle curve.

5) Effect of load on simple muscle curve.

6) Recording of normal cardiogram.

7) Effect of temperature on heart.

8) Stannius ligature.

9) Stimulation of vagus and vagal escape.

10) Effects of drugs on heart- Ach, adrenaline.

**3) Mammalian Practicals: 1O hrs.**

a) Dales tissue organ bath for record of intestinal movements arid effects of drugs.

b) Demonstration for the record of BP and respiration by long extension kymograph:

1) Normal record.

2) Effect of common carotid artery occlusion.

3) Effect of adrenalin, noradrenalin, acetyl choline.

**4) Human Practicals: 7O hrs.**

a) Clinical examination of respiratory system: vocal fremitus, vocal resonance, breath sounds.

b) Clinical examination of CVS: Arterial pulse, apex beat, heart sounds, recording of blood pressure and effects of posture and exercise on BP.

c) Clinical examination of nervous system:

1) Examination of cranial nerves.

2) Examination of sensory system.

3) Examination of motor system- examination of superficial and deep reflexes, examination of muscle tone and power.

d) Spirometry- Measurement of lung volumes and capacities.

e) Stethography- Effect of breath holding and deglutition on respiration.

0 Measurement of BMR.

g) Demonstration of ECG, EEG, EMG, ophthalmoscope, bicycle ergometer and arterial blood gas analysis.