

SARDAR PATEL UNIVERSITY
Programme: MSC (Zoology)
Semester: III
Syllabus with effect from: June 2011

Paper Code: PS03CZOO03	Total Credits: 4
Title Of Paper: Applied Physiology	

Unit	Description in detail	Weightage (%)
1	<p>Physiology of Nutrition and Digestion: The essential nutrients, types of food, vitamins, minerals, water and the concept of 'balanced diet'. Carbohydrate, lipid and protein metabolism, An overview of human digestive tract, Digestion and absorption of carbohydrates, proteins and fats, Neural and endocrine regulation of gastro-intestinal movement and secretion, Obesity, starvation and stimulation of hunger and thirst.</p>	
2	<p>Physiology of Respiration and Circulation: An overview of human respiratory system, Respiratory movements and the exchange of respiratory gases at pulmonary surfaces, Neural and humoral control of respiration. Transport of respiratory gases in blood, Respiratory 'acidosis' and 'alkalosis' and the concept of 'alkali- reserve' and regulation of blood pH, Respiratory disorders: hypoxia and oxygen therapy, dyspnea, high altitude respiration. An overview of human circulatory system. The myogenic heart. Pacemaker system and conducting fibers, Neural, humoral and pharmacological regulation of cardiac amplitude and frequency, Cardiac cycle, cardiac output, blood pressure and regulation, Blood-components and functional significance. Blood coagulation and factors involved in coagulation. Haemopoiesis and blood groups, Lymph- composition and dynamics, Disorders of circulatory system: coagulation disorders, hypertension, atherosclerosis and anemias.</p>	
3	<p>Physiology of Nervous System: An overview of the human nervous system and organization. Structure of neuron, types of neurons, neuralgia, myelination. Electrical signals and signal transmission. Membrane channels, resting and action potentials, propagation of nerve impulses, synapses and types, synaptic knobs and synaptic potentials. Neurotransmitters: Physiological role of acetyl choline, aminoacids, GABA, catecholamines, nitric oxide and neuropeptides. Disorders of the nervous system: multiple sclerosis, epilepsy, neuropathy, Guillain-Barre syndrome. Neurotoxicity: neurotoxins, anaesthetics, neuro-transmission inhibitors. General properties of sensory receptors, chemical senses, hearing and vision.</p>	
4	<p>Physiology of Muscular System: An overview of the muscular tissue: types of muscle tissue, properties and functions of the muscle tissues. Skeletal muscle tissue and types. Contraction and relaxation processes and metabolism of skeletal muscle fibers. Physiology of smooth muscle. Disorders of muscular system: Myasthenia Gravis, muscular dystrophy, fibromyalgia, muscular atrophy and hypertrophy, Rigor Mortis.</p>	
5	<p>Physiology of Excretory and Reproductive Systems: An overview of human urinary system. The functional anatomy of human kidney and the functional units. Ultrafiltration, reabsorption and secretion as transport mechanisms involved in urine formation. Control of urinary concentrations of glucose, urea, sodium and potassium ions and hydrogen ions and pH of urine. Role of kidney in body water, electrolyte and acid-base</p>	



	<p>balance. Physiological roles of aldosterone, anti-diuretic hormone and rennin-angiotensin system in renal functions. Renal malfunctions and hemodialysis. An overview of organization of human male and female reproductive systems. Histological features of male and female gonads. The process of gametogenesis (spermatogenesis and oogenesis). Phases and hormonal regulation of female reproductive cycles. Birth control: Physiology of birth control methods. Disorders of reproductive systems: testicular cancer, prostate disorders, cryptorchidism and hernias, PMS, PMDD, ovarian and cervical cancers.</p>	
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Basic Text & Reference Books:

- Guyton, A.C and Hall J.E.: Textbook of Medical Physiology. W.B.Saunders Co. Philadelphia.
- Tortora, G. J.: Principles of Anatomy and Physiology. John Wiley & Sons, Inc.
- Chatterjee, C.C.: Human Physiology (Vol. I, II, III). Medical & Allied Agency.
- James A. Wilson: Principles of Anatomy and Physiology. Macmillan Publishing Co.

