

SEMESTER-4								
Course Type	Course Code	Name of the Course	Credit	Contact Hours/ Week	Internal Assessment marks	End Term Marks	Max. Marks	Exam Duration
CC-A4 4 credits		Biomolecules and Mammalian Physiology	3	3	25	50	75	2 hrs.
		Practical	1	2	5	20	25	2 hrs.
Level of the course: 100-199								
Pre-requisite for the course (if any): Biology as a Subject at 4.0 Level (Class XII)								
Course Learning Outcomes (CLO)								
During this course, students would be able to								
<ul style="list-style-type: none"> understand the basic structure and metabolic fate of carbohydrates, proteins and fats and understand the mechanics of enzyme action. Gain knowledge about the principles of physiology of both cells and organisms. Acquire appropriate understanding of functioning of each system and their regulation Perform some basic qualitative analytical test of some biomolecules 								
Instructions for Paper-Setter								
1. Nine questions will be set in all. All questions will carry equal marks.								
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.								
UNIT	TOPICS						CONTACT HOURS	
I	Introduction to Biomolecules: Introduction, classification, structure, function and general properties of Proteins, carbohydrates, fats and nucleic acids Enzyme action and regulation Mechanism of action (induced fit theory), Enzyme Kinetics (Michaelis Menten equation for single enzyme single substrate reactions), Enzyme inhibition and regulation.						12	
II	Physiology of Digestion: Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids. Assimilation Physiology of Respiration: Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood, oxygen dissociation curve of hemoglobin, Bohr's effect, Hamburger's phenomenon (Chloride shift), control / regulation of respiration.						11	
III	Excretion: Patterns of excretory products viz. Amonotelic, ureotelic uricotelic, ornithine cycle (Kreb's- Henseleit cycle) for urea formation in liver. Urine formation, counter-current mechanism of urine concentration, osmoregulation Physiology of Circulation: Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle, electrocardiogram, cardiac output, Composition and functions of blood & lymph; Mechanism of coagulation of blood, haemopoiesis.						11	
IV	Neural Integration: Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse. Chemical integration of Endocrinology: Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads.						11	

V Practical	<ol style="list-style-type: none"> 1. Perform qualitative tests to identify functional groups of carbohydrates in given solutions (Glucose, Fructose, Sucrose, Lactose and Starch) 2. Knowledge of daily requirement and deficiency disorders of macronutrients (Carbohydrates, Fats and proteins) and micronutrients like Iron, Zinc, Calcium, Magnesium etc. in the diet of children, young adults, pregnant/lactating and elderly. 3. Study of activity of salivary amylase under optimum conditions, effect of temperature, pH on activity of Salivary amylase 4. Preparation of Hematin crystals from dry or fresh blood 5. DLC from your own blood 6. Hb estimation from your own blood 7. Study the Use of respirometer/Kymograph 	30
Learning Resources		
<ol style="list-style-type: none"> 1. Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). Principles of Biochemistry. IV Edition. W.H. Freeman and Co. 2. Chatterjee C C , Human Physiology. 1992. 3. Guyton, Text book of Medical Physiology, 10th Ed. W B Saunders 23 4. Wood, D.W. Principles and Animal physiology,1968. 		