

## Draft UG Syllabus for PHYSIOLOGY as Minor

Semester	Course Code Multidisciplinary Program	Course Code Honours with Research	Name of the paper	Credits
Semester I	PHYCOR101T	PHYMIN101T	Body Fluids and Cardio-respiratory Physiology	3
	PHYCOR101P	PHYMIN101P	Body Fluids and Cardio-respiratory Physiology Lab	2
Semester II	PHYCOR202T	PHYMIN202T	Physiological Chemistry, Gastrointestinal and Nutritional Physiology, and Excretion	3
	PHYCOR202P	PHYMIN202P	Physiological Chemistry, Gastrointestinal and Nutritional Physiology, and Excretion Lab	2
Semester III	PHYCOR303T	PHYMIN303T	Nerve - Muscle Physiology & Nervous System	3
	PHYCOR303P	PHYMIN303P	Nerve - Muscle Physiology & Nervous System Lab	2
Semester IV	PHYCOR404T	Not Applicable	Endocrinology & Reproduction	3
	PHYCOR404P	Not Applicable	Endocrinology & Reproduction Lab	2
Semester V	PHYCOR505T	Not Applicable	Sports and Exercise Physiology	3
	PHYCOR505P	Not Applicable	Sports and Exercise Physiology Lab	2
Semester VI	PHYCOR606T	Not Applicable	Public Health and Community Nutrition, and Environmental Physiology	3
	PHYCOR606P	Not Applicable	Public Health and Community Nutrition, and Environmental Physiology Lab	2
Semester VII (for 4 Yrs Honours/ Hons. With Research)	Not Applicable	PHYHSM704T	Sports Physiology & Ergonomics	3
		PHYHSM704P	Sports Physiology & Ergonomics Lab	2
	Not Applicable	PHYHSM705T	Social and Environmental Physiology	3
		PHYHSM705P	Social and Environmental Physiology Lab	2

## **SEMESTER I PHYSIOLOGY MINOR**

**Course Code : PHYCOR101T / PHYMIN101T      3 Credits**

**M 1 T- BODY FLUIDS AND CARDIO-RESPIRATORY PHYSIOLOGY      3 Credits  
(1+1+1)**

***Body Fluids.*** Blood- formation, composition, circulation, and functions. Blood vessels: artery, vein, capillaries. Hemoglobin- structure, types, functions. Blood disorders- anemia, thalassemia, leukemia, hemophilia. Blood groups (ABO & Rh systems), Blood transfusion, and Blood storage. Lymph- formation, composition, circulation, and functions.

***Cardiac Physiology.*** Anatomy of Heart. Electrical Activity of the heart: Electrocardiogram, Cardiac Arrhythmias, Hypertrophy and Cardiomyopathy. Cardiac Cycle, Heart sounds, Cardiac Output. Cardiovascular regulatory Mechanisms: Local, Hormonal, Neural. Arterial blood pressure, Korotkoff sounds. Coronary Circulation.

***Respiratory Physiology.*** Anatomy of Respiratory tract and Lungs. Pulmonary Function: Mechanics of breathing, Gas Exchange in the lungs & tissues, Pulmonary Circulation, Other Functions of the Respiratory System. Oxygen & Carbon Dioxide Transport, Hypercapnia (respiratory acidosis) and hypocapnia (respiratory alkalosis). Neural & Chemical Regulation of Respiration. Forms of Hypoxia. Chronic obstructive pulmonary disease (COPD). Artificial Respiration.

**Course Code : PHYCOR101P / PHYMIN101P      (2 Credits)**

**M 1 P- BODY FLUIDS AND CARDIO-RESPIRATORY PHYSIOLOGY Lab**

Study and Identification of Stained Sections of Different Mammalian Tissues and Organs- Artery, Vein, Cardiac Muscle, Trachea, Lungs.

Preparation of blood smear and identification of blood cells. Determination of blood group.

Sphygmomanometric measurement of arterial blood pressure at rest. Measurement of oxygen saturation by pulse oximeter before and after exercise. Measurement of peak expiratory flow rate.

Demonstration: Differential count of WBC. Total count of RBC and WBC. Bleeding time and clotting time. Pneumographic recording of effects of talking, drinking, laughing, coughing, exercise, hyperventilation and breath holding. Study of Kymograph and its accessories. Electrocardiogram. Cardiopulmonary Resuscitation (CPR).

## **SEMESTER II PHYSIOLOGY MINOR**

**Course Code : PHYCOR202T / PHYMIN202T (3 Credits)**

### **M 2T- PHYSIOLOGICAL CHEMISTRY, GASTROINTESTINAL AND NUTRITIONAL PHYSIOLOGY, AND EXCRETION Credits (1+1+1)**

***Physiological Chemistry.*** Classification, structure, Properties and Functions of Carbohydrates, Proteins and lipids, DNAs and RNAs, Enzymes. Coenzymes, Cofactor, Prosthetic Groups. Mechanism of enzyme action. Michaelis-Menten equation, Hyperbolic kinetics, Enzyme Inhibition. Factors regulating enzyme activities. Isoenzymes, Allosteric enzymes, Ribozymes, Abzymes, Rate limiting enzymes.

***Gastrointestinal and Nutritional Physiology.*** Anatomy of Gastrointestinal tract. Digestion & absorption, Mechanism and Regulation of Gastric HCl secretion. Gastrointestinal hormones, Exocrine Functions. Gastrointestinal Diseases- Constipation, irritable bowel syndrome (IBS), inflammatory bowel disease (IBD), gastroesophageal reflux disease (GERD), functional dyspepsia, hemorrhoids, colitis, ulcers, colorectal cancer, gall stone, fatty liver disease.

BMR, RQ, RDA, SDA, NPU, Biological value of Proteins. Vitamins. Minerals. Calorie requirement. Balanced diet. ACU. Metabolism of carbohydrates, proteins and lipids.

***Excretion.*** Anatomy and function of Renal System. Micturition. Renal Circulation, Non-excretory function of kidney. Chronic kidney disease. Other excretory organs: Skin, Liver, Large intestine, and Lungs.

**Course Code : PHYCOR202P / PHYMIN202P (2 Credits)**

### **M 2P- PHYSIOLOGICAL CHEMISTRY, GASTROINTESTINAL AND NUTRITIONAL PHYSIOLOGY, AND EXCRETION Lab**

Qualitative tests for the identification of physiologically important substances: Hydrochloric acid, lactic Acid, Uric Acid, Glucose, Galactose, Fructose, Sucrose, Lactose, Albumin, Gelatin, Peptone, Starch, Dextrin, Urea, Glycerol, Bile salts.

Study and Identification of Stained Sections of Different Mammalian Tissues and Organs- Tongue, Salivary Glands, Esophagus, Stomach, Duodenum, Jejunum, Ileum, Large intestine, Liver, Pancreas, Kidney.

Demonstration: Identification of normal and abnormal constituents of urine. Quantitative estimation of glucose and sucrose and lactose by Benedict's method. Quantitative estimation of amino nitrogen [Sorensen's formol titration method (percentage as well as total quantity)], Urine albumin-creatinine ratio (ACR).