Department of Liberal Education
Era University, Lucknow
Course Outline
Effective From: 2023-24

Name of the Program B.A. / B.Sc. (LIBERAL EDUCATION) Year/ Semester:2nd year/3rd semester					
Course Name	Fundamentals of Physiology	**Course Code:**	**BCH201**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**40 Marks**		**End Term Exam:**	**35 Marks**
Type of Course	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	Biochemistry requires the knowledge of fundamentals of human biology, which comprises of the structure, principals and methods of functions of various organs, and the role of biochemistry in it. In this semester the students would learn the basics of human physiology and will be introduced to contemporary developments and issues.				
Course Outcomes(CO): *After the successful course completion, learners will develop following attributes:*					
Course Outcome (CO)	**Attributes**				
CO1	The students would be able to identify the major organs and organ system and their gross anatomy				
CO2	The students can delineate the physiological reactions and their significance				
CO3	The students can correlate some physiological actions such as respirations, oxygen transport, transport across membranes, specially in muscle and nerve functions, reproduction, growth etc, with their possible disorders and diseases				
CO4	The student can correlate the biochemistry of metabolic reactions of molecules with the physiological events , coordination and recent developments.				
Pedagogy	Interactive, discussion-bases, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 20 Marks Class test: 05 Marks Online Test/Objective Test: 05 Marks Assignments/Presentation: 05 Marks Attendance: 05 Marks				

Session Details	Topic	Hours	Mapped CO
Unit 1	**Musculosketetal system:** • Types of bone and muscles. • Structure and formation. • Physiology of muscle contraction in striated, non-striated and cardiac muscles. • Role of nutrition and exercise in muscle function. **Cardiovascular physiology:** • Functional anatomy of the heart • Properties of cardiac muscles • Mechanism of working of heart: cardiac output, cardiac cycle, origin & conduction of heart beat. • Characteristics of normal ECG waves **Blood and lymph:** • Composition of blood and role of each component • Plasma proteins & their role • Blood groups • Mechanism of coagulation of blood, anticoagulant and fibrinolytic systems. • Diseases of Blood: Types of Anemias Thalessemia, Polycythemia, Haemophilia, Thrombosis, Leukemia • Lymph and Lymphatic system.	18	CO1, CO2, CO3, CO4
Unit 2	**Homeostasis and the organization of body fluid compartments**: • Intracellular, extracellular and interstitial fluid. • Concept of Homeostasis **Concept and role in human physiology of** • pH, acids and bases • physiological buffers, acidosis, alkalosis **Respiratory system**: • Exchange of gases, transport of O2, role of hemoglobin, dissociation curve of oxyhemoglobin and its significance, • Bohr vs Haldane effect, • Transport of CO2 and chloride shift. • Effect of smoking and common diseases related to respiratory system: COPD, Tuberculosis, COVID19	14	CO1, CO2, CO3, CO4
Unit 3	**Gastrointestinal and hepatic physiology:** • General structure of Gastro Intestinal tract.	14	CO1, CO2, CO3, CO4

	• Mechanism of digestion & absorption of carbohydrates, proteins, lipids and nucleic acids. • Composition and function of saliva, gastric, pancreatic, bile and intestinal juice. • Gastrointestinal hormones and their actions • Related diseases **Renal physiology:** • Anatomy of the kidney and the nephron. • Cell biology of the Bowmans' capsule • Regulation of renal blood flow. Physiology of glomerular filtration and GFR. Tubular processing of the glomerular filtrate. • Micturition reflex and voluntary control of micturition. • Blood buffer systems, renal and pulmonary control of blood pH, renal clearance. • Assessment of kidney function. Glomerular nephritis, renal failure, dialysis and diuretics		
Unit 4	**Reproductive physiology**: • Sex determination and differentiation. • Male and female genital tract development • Spermatogenesis, capacitation and transport of sperm, blood testis barrier. • Ovarian function and its control. • Uterine changes, fertilization and implantation • Placenta as a feto- maternal unit, gestation and parturition. • Concept of Test-tube baby and surrogacy **Neurochemistry and neurophysiology:** • Central Nervous system. Peripheral Nervous system. • Parts of brain, blood brain barrier and CSF. • Sensory receptors and neural pathways. Somatic sensation. • Membrane potentials.Synaptic transmission. • Neurotransmitters. • Neural pathways • Understanding EEG	14	CO1, CO2, CO3, CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	3	1	2	2	3	1	2	3	2	3	2	1
CO2	2	3	2	2	2	3	3	1	2	3	3	2	2	2
CO3	3	3	3	2	2	2	2	1	3	3	3	2	2	1
CO4	3	2	2	3	2	2	3	2	3	2	2	2	3	3

Strongcontribution-3, ***Averagecontribution-2,*** ***Lowcontribution-1,***

Suggested Readings:	
Text-Books	1. B D Chaurasia's Applied Anatomy & Physiology for BSc Nursing Students 2. Ross And Wilson Anatomy And Physiology In Health And Illness (11th Edition) Publishers Churchill Livingstone 3. Fundamentals of Anatomy And Physiology For Nursing And Healthcare Students Ian Peate and Muralitharan Nair. Wiley Publication. 2nd Edition
Reference Books	1. Human Anatomy and Physiology Theory and Practical. Garg K. CBS Publishers and Distributers. 2nd Edition 2. Essentials of Anatomy and Physiology, Scanlon VC & Sanders T FA Davis Publishers. Latest Edition.
Para Text	1. Notes: http://openstaxcollege.org 2. E-Book: https://www.textbookequity.org/Textbooks/HumanBiologyCK12.pdf

Recapitulation & Examination Pattern

Component	**Marks**	**Pattern**
Mid Semester	20	**Section A:** Contains **10** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **0.5Marks.** **Section B:** Contains **07** descriptive questions out of which **05** questions are to be attempted. Each question carries **03 Marks**.
Class Test	05	Contains **05 descriptive questions.** Each question carries **01** Mark.
Online Test/ Objective Test	05	Contains **10 multiple choice questions.** Each question carries **0.5**Marks.
Assignment/ Presentation	05	Assignment to be made on topics and instruction given by subject teacher.
Attendance	05	As per policy.
Total Marks	**40**	

Course created by: Dr. Ghazala Zaidi

Signature:

Approved by: Prof. Sudhir Mehrotra

Signature: