PHOTOGRAPH

SYLLABUS :

https://www.caluniv.ac.in/cbcs-ug/ug-files/UG-Physiology.pdf

PROGRAM & COURSES OUTCOME :

Both physiology Honours and general syllabus help the students to basic topics of human physiology.

A. B.SC PHYSIOLOGY (HONOURS):

CORE COURSES:

1) Obtaining extensive exposure to the various aspects of human physiology with the core essence pf life sciences.

2) Various types of practical classes are designed to enhance basic understanding of living system physiology.

B. B.SC PHYSIOLOGY (GENERAL):

CORE COURSES:

Exposure and appreciation of some basic parts of human physiology

C. DISCIPLINE SPECIFIC ELECTIVE COURSES (DSE): HONOURS & GENERAL:

1) Exposure to allied parts of life sciences with core essence of physiology.

2) In Honours course there is option for students to participate in field work where various community study of various aspects of antropometric measurements are done.

D. SKILL ENHANCEMENT COURSES (SEC): HONOURS & GENERAL:

Obtaining extensive exposure to various topics of life sciences.

PROGRAM & COURSES OUTCOME

1. Programme-specific outcomes:

Physiology as a subject aims to deliver an in depth scientific understanding of human body function in a harmonic and sequestrated milieu of the organ systems. Cardiovascular system, Nervous System, Respiratory system, Excretory system, Digestive system, Musculoskeletal system, Endocrine system play an important role in controlling our bodily functions. These systems form the core area of our subject, while Biochemistry, Biophysics, Microbiology & Immunology , Molecular Biology, Nutrition, Sports and Exercise Physiology, Ergonomics, Biostatistics, Environmental Physiology, Toxicology and Pharmacology are taught as allied subjects that form the Discipline Specific Electives courses. All these help nurture and develop a comprehensive understanding of Human Physiology. At the same time certain Skill Enhancement Courses like Clinical Biochemistry, Hematological techniques, Bioinformatics,Xenobiotics aim to develop more specialized areas which involve Physiology of health and disease. A student of this course would be able to pursue in academic spheres as well as attain capabilities of entrepreneurship and work in diversified research areas both in applied and basic fields.

Students gain knowledge and skill in the fundamentals of Human Physiology and understand the complex interactions among various living organisms. Recognized the relationships between structure and functions at different levels of biological organization (e.g., molecules, cells, organs, organisms, populations, and species) for humans. Gains knowledge about research methodologies, effective communication and skills of problem solving methods and to inculcate the scientific temperament in the students and outside the scientific community. Perform procedures as per laboratory standards in the areas of hematology, histology, qualitative and quantitative biochemistry, experimental physiology and various human experiments. And develop research oriented skills Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of physiological experiments.

2. Course outcome :

SEM	COURSE	CONTENTS	OUTCOPME
SEM-I	CC1	Cellular basis of physiology and enzyme	1. Upon completion of the course the student should be able to understand theconcept and knowledge of cell structure, functions, cellular transport, concept of chromosome, its structure and cell-cycle. The student should also be able tounderstand the concept of enzyme, its properties, kinetics and functions. 2.Use scientific laboratory equipment in order to gather and analyse data on cell biology. 3.Communicate information related to cell biology, chromosome and enzymesystem through written, verbal, or multimedia formats, in order to assess current knowledge, answer investigative questions, and explore new questions.
	CC2	Biophysical principles, instrumentationand biochemistry of molecules .	1.Upon completion of the course the student should be able to understand biophysical principles like osmosis, diffusion, surface tension & viscosity, pH & buffer, thermodynamic principles, colloid etc., in details and their physiologicalapplication as far as human body is concerned.

			2.To understand principle of construction, uses, advantages and disadvantages of some instruments of importance in biology such as Microscopes, Spectro- photometer, Photoelectric-colorimeter, pH meter 3.They should also be able to understand the structure, isomerism, properties,reactions and uses of some major biomolecules like carbohydrate, lipid, proteinand nucleic acid. 4. To be able to identify an unknown solution of physiological importance through sequential biochemical tests and to prepare a buffer solution and determination of pH of that using pH meter and buffer capsules.
SEM-2	CC3	Cell-signaling, nerve and muscle	1.Upon completion of the course the student should have an enhanced knowledge and appreciation of various cell-signalling pathways and understand the EM structure, histology, properties and functions of nerves and muscles ofhuman body. 2.To understand how these separate systems interact to yield integrated physiological responses. 3.To stain and identify fresh tissues like nerves, skeletal muscle, cardiacmuscles, and collagen tissue using laboratory equipment.
	CC4	Nervous systemand molecular neurobiology	1.On satisfying the requirements of this course, students will have the knowledge and skills to describe the structure of major centres of human brainand explain their role in the maintenance of overall homeostasis. 2.To have an enhanced knowledge and appreciation of molecular structure ofvarious neurotransmitter molecules and their mode of functions. 3.To be able to perform, analyze and report on kymographic experiments andobservations in nerve-muscle physiology and to have a first-hand idea of various reflexes of human body
SEM3	CC5	Physiology of Blood and Body-fluids	1.Upon completion of the course the student should be able to understand theconcept and knowledge of various blood corpuscles, their formations, physiological functions and disorders related to their malformation or malfunction. 2.To be able to perform various hematological experiments in laboratory usinghuman blood and to analyze and interpret their observations.
	CC6	Cardio-vascular system.	1.Upon completion of the course the student should have an enhanced knowledge and appreciation of basic structural and functional features of heartand blood vessels with their regulation through brain-centers. 2.To be able to understand the principle of electrocardiography, the lead system, interpretation of normal ECG in laboratory. 3.To be able to carry out kymographic experiments on perfused heart of toad. 4.To be able to record the blood pressure of human subject using sphygmomanometry and interpret the observations.

	CC7	Respiratory System	1.To be able to understand the structure and function of lung and the normalphysiology of respiration and to know various disorders associated with breathing. 2.To understand how cardiovascular, respiratory and nervous system interactto yield integrated physiological responses to challenges such as exercise or ascent to high altitude etc. 3.to be able to perform the pneumographic experiments on human breathingand to carry out lung-function tests.
	SEC-A1	Haematological techniques	Upon completion of this course the student be able to gather knowledge on various hematological techniques like blood group identification, blood banking. determination of TC, DC, ESR, Arneth count etc. of human. He /she will be able to learn various disorders related to RBC, WBC and platelets
SEM-4	CC8	Digestion and metabolism	1.Upon completion of the course the student should have an enhanced knowledge and appreciation of general anatomy of digestive system, processof digestion of food and metabolism of biomolecules in human. 2.To be able to perform Dale's mono bath experiments to record the movement of isolated intestine of mammalian system. 3.To be able to quantify amino-nitrogen content using Sorensen's formol titration method.
	CC9	Molecular biology and Methodologies	1.Upon completion of the course the student should be able to understand theconcept and knowledge of the molecular activities of genetic element like replication, transcription, translation and repair and also the biology of cancer. 2.To understand the methodologies of various techniques of molecular biology which includes chromatography, electrophoresis, blotting techniques and centrifugation. 3.To be able to perform colorimetric estimation of various serum parameters in laboratory and to interpret the observations thereafter and to be able to conduct paper-chromatography experiments to identify amino-acid.
	CC10	Nutrition & dietetics.	1.Upon completion of the course the student should have an enhanced knowledge and appreciation of dietary sources, biological function, deficiencysymptoms of different vitamins and minerals. 2.To be able to understand the principle of formulation of balanced diet for people under various biological conditions and needs. 3.To be able to conduct simple qualitative analysis of some common food stafflike milk, rice, pulses, potatoes and flour.

	SEC-B1	Detection ofFood additivesand xenobiotics	1. Upon completion, the student would have enhanced knowledge on healthhazards associated with various food additive and adulterants 2.To understand the types, sources, reactions and fate of different xenobiotic compound and their de-toxification
SEM5	CC11	Special senses	1. Upon completion of the course the student should have an enhanced knowledge of special sense organs and physiology of senses including those of vision, audition, gustation and olfaction. 2.To be able to perform simple experiments on colour vision, visual acuity and hearing. They should also be able to identify permanent histological slidesunder microscope.
	CC12	Endocrinology	1.Upon completion of the course the student should be able to understand the concept and knowledge of the histological structures of various endocrine gland and to understand the chemical nature, biosynthesis, biological action, regulation of synthesis and disorders associated with those hormones. 2.At the end of the course, the student would be able to identify permanent histological slides under microscope and would be able to stain and identify tissue glycogen via PAS staining.
	DSE-A1	Biostatistics	1.Upon completion of the course the student should have an elaborated knowledge of the basics of biostatistics. The student will also learn to apply theknowledge in planning of experiments on human population. 2.At the end of the course the student will be able to perform statistical analysis and ANOVA on biological data in computer. He/she will also able to graphically express the results of analysis as and when required.
	DSE-B1	Work, exerciseand sports physiology	1.Upon completion of the course the student should have an enhanced knowledge of work and exercise physiology. The student should have a clear understanding of assessment of work load, fitness, training and bioenergeticsin particular. 2.The student should be able to determine various human body-indices using direct anthropometric data on human subject. The student should also be ableto record the variation of cardio-vascular parameters like blood pressure and hear rate in static and dynamic work conditions.
SEM6	CC13	Reproductive biology and developmental biology.	1.Upon completion of the course the student should have an enhanced knowledge and appreciation of reproductive biology of human, i.e., histologyof major sex organs, maturation of sperm and ovum, process of fertilization,and implantation etc. 2.To be able to know the embryonic development of various organ system in details.

		3.At the end of the course, the student would be able to identify permanent histological slides under microscope and would be able to stain and identify cellspaces of urinary bladder.
CC14	Excretory system and environmental pollution &human health	1.Upon completion of the course the student should have an understanding of anatomy, histology and biology of excretion. The student should be able to know the normal process of formation urine and renal clearance tests. 2.At the end of the course, the student should be able to have a clear concept of mechanism of sweat secretion and body temperature regulation. 3.to have a clear understanding of the effects of various environment pollutants including chlorinated hydrocarbons, organophosphorus, organo-carbamate, lead, arsenic, fluorine etc. on human. 4.To be able to identify normal and abnormal constituents of urine using proper biochemical tests in laboratory. The student would also be able to stainhistological slides with hematoxylin -eosin stain and be able to identify sectionsunder microscope.
DSE-A4	Community and public health	1.Upon completion of this course, the student will be able to know the basics of various community health issues. He/she would be able to know the etiology, symptoms and prevention of different public health conditions like PCM, infertility, endemic goiter, xeropthalmia, beriberi, nutritional anemia etc. and many other communicable and non-communicable diseases. 2.The student will be able to calculate many body-indices depending on anthropometric measurements. 3.The student will be able to perform community survey and epidemiological survey on field and will be able to draw inferences from their observations.
DSE-B3	Chronobiology and stress physiology	1.On completion of the course, the student will have an enhanced knowledgeon stress physiology particularly the concept of GAS and effect of chronic stresson various organ -system. 2.The student will be able to understand various aspects of biological rhythm and its influence on major endocrine system and other physiological parameters. 3.The student will also develop knowledge on influence of hypobaric and hyperbaric conditions on human body. He/she will also be able to decrypt the condition of oxidative stress on human body.

		4.To be able to conduct community survey to find out the chronotype of human population and assess environmental heat -load and noise-level in the immediate surroundings.

. DEPARTMENTALCOMPOSITION:

Passport size photo	Name	Educational qualification	Designation	Specialization	Contact Phone E-mail,
	Dr. Arnab Chaudhuri	Ph.D	Associate Professor	Biochemistry	carnabphysiology@citycollegekolkata.org
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