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Zoology Department

Course Learning Outcomes in B.Sc (CBZ)

Class and Paper	B.Sc. 01st Year and Paper I
Title of the Paper	Cell Biology and Non – chordata
Course Code/ Paper code	
Credits	02
Total Hours	36

Course learning outcome:

After going through the course, the student should be able to

- Understand the functioning of nucleus and extra nuclear organelles and understand the intricate cellular mechanisms involved.
- Acquire the detailed knowledge of different pathways related to cell signaling and apoptosis thus enabling them to understand the anomalies in cancer.
- Develop an understanding how cells work in healthy and diseased states and to give a 'health forecast' by analyzing the genetic database and cell information.
- Get new avenues of joining research in areas such as genetic engineering of cells, cloning, vaccines development, human fertility programme, organ transplant, etc.
- Understand how tissues are produced from cells in a normal course and about any malfunctioning which may lead to benign or malignant tumor.

Class and Paper	B.Sc. 01st Year and Paper II
Title of the Paper	Chordata and Embryology
Course Code/ Paper code	
Credits	02
Total Hours	36

Course learning outcome:

After going through the course, the student should be able to

- Develop an understanding of the evolution of vertebrates thus integrating structure, function and development.

- Have an overview of the evolutionary concepts including homology and homoplasy, and detailed discussions of major organ systems.
- Understand how cells, tissues, and organisms function at different levels. The course content also provides the basis of understanding their abnormal function in animal and human diseases and new methods for treating those diseases.
- Develop an understanding of the related disciplines, such as cell biology, neurophysiology, pharmacology, biochemistry etc.
- Get a flavor of research besides improving their writing skills and making them well versed with the current trends. It will further enable the students to think and interpret individually due to different aspects chosen.
- Undertake research in any aspect of animal physiology in future.

Class and Paper	B.Sc. 02nd Year and Paper I
Title of the Paper	Anatomy and Physiology
Course Code/ Paper code	
Credits	02
Total Hours	36

Course learning outcome:

After going through the course, the student should be able to

- Develop an understanding of the characters used to classify besides being able to differentiate the organisms belonging to different taxa.
- Acquire knowledge of the coordinated functioning of complex human body machine.
- Have hands on experience of materials demonstrating the diversity of protists and non-chordates.
- Understand the relative position of individual organs and associated structures through dissection of the invertebrate representatives.
- Realize that very similar physiological mechanisms are used in very diverse organisms.
- Get a flavor of research by working on project besides improving their writing skills. It will further enable the students to think and interpret individually.
- Undertake research in any aspect of animal physiology in future.

Class and Paper	B.Sc. 02nd Year and Paper II
Title of the Paper	Vertebrate Endocrinology, Reproductive Biology Behaviour, Evolution and Applied Zoology
Course Code/ Paper code	
Credits	02
Total Hours	36

Course learning outcome:

After going through the course, the student should be able to

- Understand neurohormones and neurosecretions.
- Learn about hypothalamo and hypapophysial axis.
- Understand about different endocrine glands and their disorders.
- Understand the mechanism of hormone action.
- Understand the culture techniques of prawn, pearl and fish.
- Understand silkworms rearing and their products
- Understand the Bee keeping equipments and apiary management.
- Understand dairy animals management, the breeds and diseases of goats and learn the testing of egg and milk quality.
- Learn various concepts of lac cultivation.
- Be aware of a broad array of career options and activities in human medicine, biomedical research and allied health professions.
- Acquire an in-depth knowledge on the diversity and relationships in animal world.
- Develop a holistic appreciation on the phylogeny and adaptations in animals.
- Enable the students to understand the evolution of universe and life.
- Understanding on the process and theories in evolutionary biology.
- Develop an interest in the debates and discussion taking place in the field of evolutionary biology.
- Explain and contrast the processes of spermatogenesis, oogenesis.
- Demonstrate an understanding of the hormonal control of reproduction in males and how this is regulated;
- Distinguish between the main stages of embryonic, foetal and neonatal development and causes of foetal disorders.
- Understand the origin and characteristics of common congenital malformations;
- Know how sexually transmitted diseases may contribute to altered neonatal or reproductive function.
- Critically assess relevant scientific literature in Human Reproductive Biology and present their argument in oral and written work.

Class and Paper	B.Sc. 03rd Year and Paper I
Title of the Paper	Ecology, Environmental-biology; Toxicology, Microbiology and Medical Zoology
Course Code/ Paper code	
Credits	02
Total Hours	36

Course learning outcome:

After going through the course, the student should be able to

- Know the evolutionary and functional basis of animal ecology.
- Understand what makes the scientific study of animal ecology a crucial and exciting endeavour.
- Engage in field-based research activities to understand well the theoretical aspects taught besides learning techniques for gathering data in the field.
- Analyse a biological problem, derive testable hypotheses and then design experiments and put the tests into practice.
- Solve the environmental problems involving interaction of humans and natural systems at local or global level.
- Carry out common procedures for culturing, purifying and diagnostics of micro-organisms understand the disease-causing potential of bacteria and viruses, and the responses of the immune system.
- Summarise and orally present current microbiological problem areas.
- Describe the mechanisms for transmission, virulence and pathogenicity in pathogenic micro-organisms.
- Diagnose the causative agents, describe pathogenesis and treatment for important diseases like malaria, leishmaniasis, trypanosomiasis, toxoplasmosis, schistosomiasis, cysticercosis, filariasis etc.
- Assess the importance of incidence, prevalence and epidemiology in microbiological diagnostic activities.
- Know how resistance development and resistance transfer occur.
- Identify the major cellular and tissue components which comprise the innate and adaptive immune system.
- Understand how are immune responses by CD4 and CD8 T cells, and B cells, initiated and regulated.
- Understand how does the immune system distinguish self from non-self .
- Gain experience at reading and evaluating the scientific literature in the area.
- Develop understanding on the microbiology diversity, processes and applications in the environment.
- Analyze the contribution of microbiology area of science in water treatment, solid waste management, bioremediation and phytoremediation.
- Evaluate the implications of mass cultivation, inoculums preparation, quality control, and vermicomposting
- Apply the skills for environmental protection
- learn basic principles of signaling pathways and mechanisms of cell death
- understand gene-environment interactions
- examine the application how xenobiotics disrupt normal cellular processes of genomics, proteomics, and metabolomics data
- understand mechanisms of systemic and organ toxicity induced by xenobiotics; and learn how to analyze and interpret complex data sets in toxicological research and deliver a scientific presentation.
- use clinical and laboratory findings in the treatment of acute toxic exposures

Class and Paper	B.Sc. 03rd Year and Paper II

Title of the Paper	Genetics, Cell Physiology, Biochemistry, Biotechnology and Bio-techniques
Course Code/ Paper code	
Credits	02
Total Hours	36

Course learning outcome:

After going through the course, the student should be able to

- Understand how DNA encodes genetic information and the function of mRNA and tRNA
- Apply the principles of Mendelian inheritance.
- Understand the cause and effect of alterations in chromosome number and structure.
- Relate the conventional and molecular methods for gene manipulation in other biological systems.
- Discuss and analyse the epigenetic modifications and imprinting and its role in diseases.
- Get new avenues of joining research in related areas such as genetic engineering of cells, cloning, genetic disorders, human fertility programme, genotoxicity, etc
- Understand about the importance and scope of biochemistry.
- Understand the structure and biological significance of carbohydrates, amino acids, proteins, lipids and nucleic acids.
- Understand the structure and function of immunoglobulins.
- Understand the concept of enzyme, its mechanism of action and regulation.
- Understand the process of DNA replication, transcription and translation.
- Learn the preparation of models of peptides and nucleotides.
- Learn biochemical tests for amino acids, carbohydrates, proteins and nucleic acids.
- Learn measurement of enzyme activity and its kinetics.
- Understand the purpose of the technique, its proper use and possible modifications/ improvement.
- Learn the theoretical basis of technique, its principle of working and its correct application.
- Learn the construction repair and adjustment of any equipment required for a technique.
- Learn the accuracy of technique.
- Learn the maintenance laboratory equipments/ tools, safety hazards and precautions.
- Understand the technique of cell and tissue culture. Learn the preparation of solution of given percentage and molarity.
- Understand the process of preparation of buffer. Learn the techniques of separation of amino acids, proteins and nucleic acids.

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