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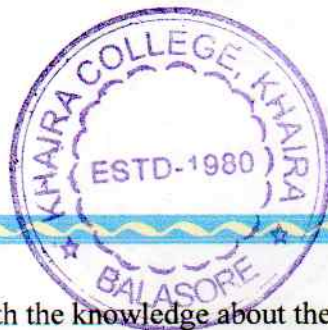
Course Outcome of Degree Syllabus of Zoology Honours

CC 1:-Non-Chordates I-Protista to Pseudocoelomates

- Students will learn about importance of systematic, taxonomy, structural organization of the animals and will appreciate diversity of non-Chordates.
- They will understand the general and specific characteristics within each phyla.
- They will understand evolutionary history and relationships of different non-Chordates through functional and structural affinities.
- They will be able to critically analyse organization, complexity and characteristic features of non-Chordates along with their significance and interactions with the environment.
- Interpret the affinities, evolutionary relationships, adaptation of the taxa and to explain their economic importance with respect to non-chordates.
- The paper of Non-chordates will help them to enhance their collaborative learning and communication skills through discussions in the class group.

CC 2:- Principles of Ecology

- Students will know the biotic and abiotic components of ecosystem.
- After completion of this course students will understand the population and community characteristics, ecosystem development and climax theories.
- Knowledge about the types of ecosystems, food chains, food webs, energy models, and ecological efficiencies.
- Capability to apply the basic principles of ecology in wildlife conservation and management.
- They will understand about the paramount role and importance of nature.



- It will impart them with the knowledge about the judicious use of existing ecological resources for sustainable development.
- They gain knowledge about statistical methods like measures of central tendency, probability and problem solving methods.
- Learns about hypothesis testing inferential statistics.

GE 1:- Animal Diversity

- The course teaches the students about the diversity of both the vertebrate and the invertebrate members of the animal kingdom.
- This course brings into perspective the regular yet largely ignored observances about the members of the animal kingdom and help students to identify and group various animals.
- The course leads the students to understand evolutionary relations between different groups in the animal kingdom, their global distribution as well as their conservation status.
- The course enables the students to prepare for further studies like MSc in Zoology, and several government jobs entrances as well.
- Learn the scope, importance and management of biodiversity.

CC 3:-Non-Chordates II : Coelomates

- Student learn the origin of multicellular organisms from unicellulareukaryotes
- Students learn about the concept and diversity of Non-Chordata with an emphasis and distinction in reference to coelom. (e.g. in first semester, protista to pseudocoelomates)
- Students learn about how organisms are classified based in Non-Chordata on their complexity, organization and characters.
- They learn about importance of systematics and taxonomy of animals.
- Students learn about Specific features for any group of organisms in non-chordates and their identification.
- They will understand the evolutionary history and relationship of different non-chordates through their structural and functional affinities and also can understand connecting links and missing links of animals.

CC 4:- Cell Biology

- Students will understand the fundamental principles of cell biology .
- Illustrate that Cell being the fundamental structural unit defines the function of all living things.
- Obtain knowledge of the structures and functions of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles.



- Understand the cellular components underlying cell division.
- Compare and contrast the events of cell cycle and its regulation.
- Explain the cell signaling and acquire detail knowledge of different cell signaling pathways.

GE 2:- Food, Nutrition and Health

- Especially important keeping in mind the covid 19 pandemic where regular attention is to be paid to diet, nutrition and health.
- This course teaches the students about regular but much ignored aspects of nutrition, and how good nutrition is a direct effector of immunity, longevity and leading a disease free life. The course is complementary to the dietary needs of all age groups and people from different walks of life.
- The course empowers the students to be future nutritionists, dieticians, along with several prospects of government and private jobs in the food and beverage industry and the obviously related health industry.
- At the culmination of this course, the students can, for themselves, practice good nutrition and provide better care for themselves and their loved ones.

CC 5:- Diversity Of Chordates

- Understand the evolutionary history and relationship between the different classes of chordates.
- Know the different characteristics along with their habits, habitats and distribution of the chordates.
- Understand the significance of the differences in physiological systems between the vertebrates.
- Distinguish the significance of the chordates from other lower organisms and comprehend their advantages.

CC 6 :- Physiology: Controlling and Coordinating systems

- Students will recognize and explain how all physiological systems work in unison to maintain homeostasis in the body and use of feedback loops to control the same.
- Students' knowledge of the structure, function and regulation of endocrine systems and nervous system would be broadened.
- Learn an integrative approach to understand the interactions of various organ systems resulting in the complex over all functioning of the body.



- The knowledge of the processes underlying male and female reproduction and fertility would be broadened.
- Students' interest and passion for biomedical sciences would be invoked.

CC 7 :- Fundamentals of Biochemistry & Microbiology

- Interpret structure-functional relationships of carbohydrates, proteins and lipids .
- Describe the structure and role of purines and pyrimidines in nucleic acids and their types, cot curves, Hypo-hyperchromicity of DNA.
- Understand the structure and function of antigen, antibody and their interactions.
- Be familiar with enzyme , mechanism of action of enzymes; coenzymes, co-factors, Isozymes; kinetics of enzyme catalysed reactions and enzyme inhibitions and regulatory process.
- Develop understanding on the microbiology diversity, processes and applications in the environment.
- Learn about basic laboratory techniques and equipments used in biochemistry.
- Perform qualitative analysis to characterize properties of various biomolecules and determine the effect of pH and temperature on salivary enzyme.

CC 8:- Comparative Anatomy Of Vertebrates

- Understand comparative account of the different vertebrate systems
- Understand the pattern of vertebrate evolution, organization and functions of various systems.
- Learn the comparative account of integument, skeletal components, their functions and modifications in different vertebrates.
- Understand the evolution of heart, modification in aortic arches, structure of respiratory organs used in aquatic, terrestrial and aerial vertebrates; and digestive system and its anatomical specializations with respect to different diets and feeding habits.
- Learn the evolution of brain, sense organs and excretory organs to a complex, highly evolved form in mammals;
- Learn to analyze and critically evaluate the structure and functions of vertebrate systems, which helps them to discern the developmental, functional and evolutionary history of vertebrate species.
- Understand the importance of comparative vertebrate anatomy to discriminate human biology.



CC 9:- Physiology: Life Sustaining systems

- Students would be able to know basic fundamentals and understand advanced concepts related to systems in the body, their feedback loop controls.
- They would be able to understand the connections between knowledge of Physiology in relation to real world situations, including healthy lifestyle decisions, diseases and disorders and homeostatic imbalances.
- They would be able to know the role of self-sustaining systems like circulatory, digestive, respiratory and excretory systems and how all of these work in unison to maintain a balance in the body.

CC 10 :- Biochemistry of Metabolic Processes

- Understand the processes in metabolism and regulation of metabolic pathways.
- Understand the metabolism of carbohydrates, proteins and lipids through various anabolic and catabolic pathways like Glycolysis, Gluconeogenesis, Krebs cycle, Glycogen metabolism, PPP pathway, Transamination, Deamination, Urea cycle, Beta and Omega oxidation of saturated fatty acids and their regulation, Ketogenesis.
- Understand the synthesis, metabolic pathways and their regulation of biomolecules.
- Know in detail about concepts to illustrate how enzymes and redox carriers and the oxidative phosphorylation machinery occur.
- Get exposure to various processes of metabolism and quantification of many biomolecules.
- Know the principles, instrumentation and application of bioanalytical techniques.
- Plan and safely perform biochemical and physiological significant enzyme assays.

SEC 2:- Biofertilizers

- Students develop their understanding on the concept of biofertilizer.
- Identify different forms of biofertilizer and their uses.
- They will learn about the systematic position, characteristics, identification, isolation, mass multiplication, associative effect and crop response of Rhizobium, Azospirillum, Azotobacter, Cyanobacteria, Azolla, Mycorrhiza, Phosphat solubilizing bacteria etc.
- Study about organic farming, green manuring and vermicompost and their uses.



CC 11:- Molecular Biology

- Be able to describe the basic structure of nucleic acids at the molecular level and with a deeper understanding of the structure of DNA students will be able to explain how RNA differs from DNA.
- Learn how the DNA is packaged inside the nucleus in association with the histone proteins and organized in a genome.
- Explain the underpinnings of the mechanism of DNA replication and repair and will be able to compare and contrast eukaryotic and prokaryotic enzymes involved in DNA replication and repair.
- Have a deeper understanding of DNA repair mechanisms, including mismatch repair, base excision, and nucleotide excision repair mechanisms and the repair of double stranded DNA.
- Explain the interrelationship of DNA, RNA and protein synthesis and how these interactions are regulated.
- Demonstrate the profound understanding of the process of transcription, including the three major steps of initiation, elongation, and termination and how this process is both similar and different in prokaryotic and eukaryotic organisms.
- Understand the characteristics of genetic code, how to interpret the codon table and explain the relationship between codons on mRNA and the amino acids in a polypeptide.
- Be able to explain how genetic information in the DNA is selectively expressed as functional proteins.
- Be able to explain how mRNAs, rRNAs and tRNAs are synthesized and processed.
- Know the components of prokaryotic and eukaryotic ribosomes and how they are organized into subunits and whole ribosomes.
- Demonstrate the deeper understanding of the mechanisms of post-transcriptional processing and the role of this process in control of gene expression.
- Understand the general mechanism of RNA splicing, and be familiar with structure and function of spliceosomes.
- Define and explain the role of ribozymes. What three properties allow some RNA molecules to function as ribozymes?

CC 12 :- Principles of Genetics

- A thorough and in-depth understanding of the chemical basis of heredity.
- Study about Mendelian and Non- Mendelian principles.
- Understand the cause, effect of chromosomal alternation with respect to number and structure, gene mutation and detection of mutations.



- Study about sex determination and extra chromosomal inheritance.
- Will have brief idea about recombination in bacteria, viruses and transposable genetic elements.
- The skills required to plan, carry out, and evaluate the outcomes of genetic experiments in animal model systems.
- Develop the necessary communication skills in the discipline required for Oral presentations of research results, and poster presentations at conferences etc.

DSE 1:-Animal Behaviour & Chronobiology

- Understand types of animal behaviour and their importance to the organisms.
- Enhance their observation, analysis, interpretation and documentation skills by taking short projects pertaining to Animal behaviour and chronobiology.
- Understand the pattern of behaviour like classical conditioning, operant conditioning, habituation, imprinting.
- Learn about communication, altruism, sexual dimorphism, mate choice, sexual selection, sexual conflict and foraging behaviour.
- Relate animal behaviour with other subjects such as Animal biodiversity, Evolutionary biology, Ecology, Conservation biology and Genetic basis of the behaviour.
- Understand various process of chronobiology in their daily life such as jet lag, biological oscillation, circadian, tidal, circannual rhythms and lunar rhythms.
- Learn about the biological clock and their application in pharmacology and modern medicine.
- Realize, appreciate and develop passion to biodiversity and will respect the nature and environment.

DSE 2 :- Immunology

- Describe the basic mechanisms, distinctions and functional interplay of innate and adaptive immunity
- Define the cellular/molecular pathways of humoral/ cell-mediated adaptive responses including the role of Major Histocompatibility Complex
- Explain the cellular and molecular aspects of lymphocyte activation, homeostasis, differentiation, and memory.
- Understand the molecular basis of complex, humoral (Cytokines, Complement) and cellular processes involved in inflammation and immunity, in states of health and disease
- Describe basic and state-of-the-art experimental methods and technologies Integrate knowledge of each subsystem to see their contribution to the functioning of higher-



level systems in health and disease including basis of vaccination, autoimmunity, MHC, Complement system, immunodeficiency, hypersensitivity and tolerance.

- Study the various types of vaccines and their use in human life.

CC 13 :- Developmental Biology

- Students will understand the mechanism that support growth and development.
- Develop critical understanding how a single called fertilized egg becomes an embryo and then a fully formed adult going through three important process of cell division, cell differentiation and morphogenesis.
- Understand how developmental processes and gene functions within a particular tissue/organism can provide insight into functions of other tissues and organisms.
- They will learn interesting and unique post embryonic development that happens in other animals.
- Understand the metamorphosis and regeneration processes of animals .
- Learn about the Invitro fertilization, stem cell and its significance.
- Understand teratogenic agents and their effects on embryonic development.
- It will help them to understand the concept of aging and the relevance of this knowledge in several medical applications.
- Develop the skill to raise and maintain culture of model system: Drosophila in the laboratory.

CC 14:- Evolutionary Biology

- Understand the evidences of organic evolution by anatomical embryological list, Palentological, Physiological, genetics and molecular biology evidences.
- Acquire problem solving and high order analytical skills by attempting numerical problems as well as performing simulation studies of various evolutionary forces in action.
- Apply knowledge gained, on populations in real time, while studying speciation, behaviour and susceptibility to diseases.
- Gain knowledge about the relationship of the evolution of various species and the environment they live in.
- Get motivated to work towards mitigating climate change so that well adapted species do not face extinction as a result of sudden drastic changes in environment.
- Use knowledge gained from study of variations, genetic drift to ensure that conservation efforts for small threatened populations are focused in right direction.
- Predict the practical implication of various evolutionary forces acting on the human population in the field of human health, agriculture and wildlife conservation.



- Use various software to generate interest towards the field of bioinformatics and coding used in programming language.
- Understand the theories of organic evolution, Isolation, Natural selection, H-W equilibrium, Genetic drift, Speciation.

DSE III:- Fish & Fishery

- Student will understand the systematic classification of native or exotic fishes.
- Learn about respiratory, reproductive, electric organs of fish and migration of fishes.
- Become aware and gain knowledge of Inland and marine fisheries in India and how it contributes to Indian economy.
- Study about intensive, semi-intensive, extensive culture of fish, brood stock management, management of fin fish hatcheries.
- Know about different kinds of fishing methods and fish preservation which can be employed for export and storage of commercial fishes.
- Learn about bacterial, viral, parasitic fish diseases, diagnosis and its treatment.
- Understand the Zebra fish as a model organism in research.

DSE IV:- Project

- Students make research proposal.
- Construct tool of data collection.
- Learn field work modalities.
- Understand the process of data analysis.
- Understand writing research paper.

A handwritten signature in blue ink, appearing to read 'R. K. S.', located above the printed name of the Principal.

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