DEPARTMENT OF ZOOLOGY

Akkamahadevi Women's University, Vijayapura

PROGRAM OUTCOMES:

- The program aims to impart quality education in subject of zoology and its applied branches.
- To provide skills of animals handling and to develop care and empathy towards animals.
- To understand and correlate the basic and complex principles governing animal sciences.
- To impart and gain knowledge and skills in the fundamentals of animal sciences and the complex interactions with environment.
- Analyze the complex interrelationships among various animal groups on basis of diversity and abundance.
- Apply the knowledge of cell & molecular biology, genetics, animal biotechnology in current researches and implications in human and animal health.
- To signify the importance of environment conservation, pollution control strategies, protection of endangered species for sustainable development.
- Gain knowledge of commercial and agro based skills of breeding, fish farming, Vermicompost and other applied aspects.

HCT-1.1: ANIMAL SYSTEMATICS 52 hrs

Course Objectives: Systematic Zoology endeavors to order this diversity of the animal world and to develop methods and principles to make this task possible.

Course Learning Outcomes (CLO):

- Systematics today is an exciting and active branch of biology and it is to be greatly wished that more students of life sciences take up systematics as their research field.
- In its broader sense, it is nothing less than a thorough and complete study of the diversity of living forms, and its domain thus encompasses ecology, evolutionary biology and biodiversity studies, in addition to the norms and principles of classification.
- Systematics has great relevance to the biological control of pests which is itself a very important aspect of applied biology.

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HCT-1.2: BIOLOGY OF NON-CHORDATES 52 hrs

Course objectives:

The course aims to study the functional and biological systems of each phyla of Non-chordates in generalised aspects. It helps to understand the functions like locomotion, Nutrition, Respiration etc, in representative animals from each phyla (Local representative species will be covered if any).

Course Learning Outcomes (CLO): After completing this course the students will be :

- Able to know the insights of biological systems of the Non-Chordate phyla.
- Able to understand the organs structure and its functions pertaining to a system.
- Able to understand and differentiate the mechanism of the systems like Locomotion, Nutrition, Respiration etc, among the phyla.
- Able to analyse how these Non-Chordates are equipped with complex body mechanisms and functions.
- To signify local biodiversity

HCT- 1.3: CELL AND MOLECULAR BIOLOGY — 52 hrs

Course objectives:

- Today's era is the study of living things at the cellular and sub-cellular levels.
- Without proper approach to these studies the mechanisms and functioning of the cells and organisms at a broader level can't be understood.
- It is utmost needed to understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles and how these cellular components are used to generate and utilize energy in cells.
- And the students will be able to apply their knowledge of cell biology to selected examples of changes or losses in cell function.
- These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation.

Course Learning Outcomes (CLO): After completing the course, Students will be able to:

- Understand and utilize the scientific vocabulary used in communicating information in cell and molecular biology.
- Represent and illustrate the structural organization of genes and the control of gene expression.
- Conceptualize and describe protein structure, folding and sorting.
- Explain the structure of membranes and intracellular compartments and relate these to function.
- Relate how cell movement and cell-cell communication occur and discuss mechanisms of signal transduction.
- Outline the processes that control eukaryotic cell cycle and cell death.
- Link the rapid advances in cell and molecular biology to a better understanding of diseases.

SCT-1.4a: BASIC AND APPLIED ENTOMOLOGY — 52 hrs

Course Objectives: To teach basic and general entomology with emphasis on agriculture, disease, management aspects.

Course Learning Outcomes:

- Attain a solid foundation in insect biology, general entomology, basic systematics, morphology, physiology and biodiversity.
- Develop the ability to design and perform a scientific study on insects, and to analyze results.
- Gain appreciation of insect in society and human affairs.

SCT-1.4 b: BIODIVERSITY AND CONSERVATION — 52 hrs

Course Objectives:

- Diversity of life on earth is an essential factor for the healthy functioning of ecosystems.
- The aim to study biodiversity is to protect, preserve and manage natural resources.

Course Learning Outcomes:

- Biodiversity is also considered to have intrinsic value, economic, ecological life support, recreation, cultural and sustenance.

SCT-1.4 c: VECTORS AND COMMUNICABLE DISEASES. 52 hrs.

Course Objectives: To learn biology of vectors and their respective diseases, epidemics, pandemics, prevention, and control measures.

Course Learning outcomes: Basic scientific awareness and identification of vectors and their health implications.

OET-1.8. ENVIRONMENTAL BIOLOGY 52hrs

Objectivess: To study fundamental principles and laws of nature, pollution and related issues, natural resources and their limitations, and conservation and related laws.

Course Learning Outcomes: Awareness and conservation attitude, to develop action plan for sustainable development, waste management and bioremediation ideas.

HCT-2.1: BIOLOGY OF CHORDATES 52 hrs

Course objectives:

- To study the concepts like evolution and adaptive radiations among different chordates.
- To study taxonomic relationships and comparative anatomy.

Course Learning Outcomes (CLO):
After undergoing the course study the students will be able to:

- describe the body plan & phylogenetic inter-relationships of protochordates and their unique characteristics.
- Understand the origin & evolutionary relationship among the different groups of Chordates.
- Know the diversity in snakes and the current status of reptilian fauna.
- describe the behavioral aspects of reproduction in chordate groups.
- describe the anatomical differences among different chordate groups.

HCT-2.2: MOLECULAR GENETICS 52hrs

Course Objectives:

- This course introduces the students to the basics of cell and its components and functioning. This gives them a strong foundation on the basic unit of life.
- Without proper approach to these studies the mechanisms and functioning of the cells and organisms at a broader level cannot be understood.
- It is utmost needed to understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles and how these cellular components are used to generate and utilize energy in cells.
- And the students will be able to apply their knowledge of cell biology to selected examples of changes or losses in cell function.
- These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation.

Course Learning Outcomes:

- Link the rapid advances in cell and molecular biology to a better understanding of diseases, including cancer.
- The tools used in molecular genetics, and their potential applications to medical and veterinary science and R&D.

HCT- 2.3: DEVELOPMENTAL BIOLOGY 52 hrs

Course objectives:

- To teach the basic and fundamental embryonic developmental stages, the post embryonic developmental aspects.
- To impart the knowledge of the pattern formation.
- To teach the later embryonic development like metamorphosis, regeneration, ageing and abnormal development like teratology.
- To teach about the cellular differentiation, organogenesis and morphogenesis in a generalized way.

Course Learning Outcomes (CLO): After learning this course the students will be able to :

- Differentiate between embryology and developmental biology.
- Understand the very basic embryonic developmental processes in different organisms.
- List out the different stages of both embryonic and post embryonic development.
- Understand that embryonic development is affected by external factors leading to abnormalities.
- Describe the differentiation of cells and underlying chemical communication mechanism.
- Describe the different stages that animals pass through before reaching the final structure.

SCT-2.4a: ECONOMIC ZOOLOGY 52 hrs

Course objectives:

- Explain plant insect interaction
- Teaching soil and worm interaction
- To make them realize relation between aquaculture and sustainable development
- Narrating significance of poultry and dairy farming to meet nutritional requirement of ever raising human population.

Course Learning Outcomes: Opportunities in terms of employability, entrepreneurship and research.

SCT-2.4b: WILDLIFE AND CONSERVATION

52 hrs

Course Objectives: To teach significance of Wildlife and Conservation in attaining Suatainable development.

Course Learning Outcomes: To act sensibly towards wildlife and discharge responsibilities towards its conservation.

Unit 1

SCT-2.4.c: ORNITHOLOGY

52 hrs

Course Objectives: To learn basic biology of birds, behavioral aspects, economic values, distribution with special emphasis on tools and techniques of identification.

Course Learning Outcomes:

- To understand basic biology of Birds
- To recognize and identify regional major Avian groups.
- To recognize Avian species by Sound and Sight.
- To gather information regarding the timing and routing of migration, survival rates, social structures, population trends and more.

OET-2.9. VECTORS AND COMMUNICABLE DISEASES

52 hrs.

Course Objectives: To learn biology of vectors and their respective diseases, epidemics, pandemics, prevention, and control measures.

Course Learning outcomes: Basic scientific awareness and identification of vectors and their health implications.

HCT- 3.1: ANIMAL PHYSIOLGY

52 hrs

Course Objectives:

- This course is aimed to impart the knowledge on the physiology and its related mechanisms considering the overall animal kingdom.
- This course offers an insight through the various metabolic processes like respiration, circulation, digestion, neurophysiology that runs the animal life.
- The study also focuses on broad aspects of homeostatic regulatory mechanisms like hormonal activities, osmoregulation & thermoregulation.

Course Learning Outcomes (CLO): After learning the course the students will be able to :

- Know the historical aspects of animal physiology, its disciplines and its importance in Zoological studies.
- Understand how the animal body functions with the help of various control & co-ordination centres.
- Describe about the organs and their structures pertaining to their physiology.
- Describe about the flow of energy that is required to run the metabolism.
- Understand about the various strategies that different animals undertake to survive their habitats.

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HCT-3.2: ENDOCRINOLOGY AND REPRODUCTIVE BIOLOGY

52 hrs

Course Objectives:

- To offer a combination of two related and intermingled areas like reproduction and endocrine control of various physiological actions.
- To teach the basic techniques involved in endocrinological studies.
- To teach the classification of hormones and study of growth factors.
- To teach the synthesis, chemical structure and the biological actions of hormones and their receptors on various tissues of the body.
- To impart vast idea about the reproductive organs, their development and functioning, with keen emphasis on gametogenesis.
- To teach the details of the specific structures pertaining to mammals like placenta and the process of implantation.
- To teach the pre-natal, natal & post-natal processes, with reproductive techniques.

ourse Learning outcomes (CLO): After the study of this course the students will be able to :

- Know the importance of long-term co-ordination & communication between Endocrine & Reproductive Physiology.
- Narrate the anatomy and physiology of reproduction.
- Describe the different Assisted Reproductive Techniques (ARTs) & fertility control methods that are much required today.
- Know the importance of growth factors & hormones in the current research field.
- Know the comprehensive knowledge of hormones and their respective actions.

SCT-3.3a: ANIMAL BEHAVIOUR

52 hrs

Course Objectives: Upon completion of this lesson, students will be able to define animal behavior and to list and describe the factors that influence animal behavior.

Course Learning Outcomes:

- Students acquire knowledge of key concepts and principles and overarching themes in animal behavior, animal cognition, conservation psychology/biology, animal welfare science, comparative psychology and research methods.
- Students acquire credentials for employment in fields related to Animal Behavior and Conservation.
- Students learn to reason scientifically, gain information literacy skills, interpret statistical information, and learn to interpret and design studies in animal behavior and cognition and also to apply ethical standards in conducting and evaluating psychological and behavioral research, build and enhance interpersonal relationships, adopt values that build community at local, national, and global levels.

SCT-3.3b: MICROBIOLOGY

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Course Objectives: To learn and understand the fundamentals of microbes and their biology along with economic and industrial applications. **52 hrs**

Course Learning Outcomes:

- Generates skilled human resources to address disease and epidemics.
- Students will acquire competency in laboratory skills applicable to research or clinical methods, including accurately reporting observations and analysis.

Unit 1:

SCT-3.3C: TOXICOLOGY

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Course Objectives: To learn about basic toxicological science. Methods to determine the adverse effect of xenobiotics on living forms and environment. **52 hrs**

Course Learning Outcomes: Students will acquire

- Ideas about biominitoring, alternative ways of pest control
- Pros and cons of pesticide application

OET-3.8: PARASITOLOGY

52hrs

Course Objectives: To teach biology of parasites and their pathogenicity.

Course Learning Outcomes: Generates skilled human resource to address parasite borne diseases, R&D in various related disciplines.

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HCT-4.1: ENVIRONMENTAL BIOLOGY

52hrs

Course Objectives: To study fundamental principles and laws of nature, pollution and related issues, natural resources and their limitations, and conservation and related laws.

Course Learning Outcomes: Awareness and conservation attitude, to develop action plan for sustainable development, waste management and bioremediation ideas.

HCT- 4.2: ANIMAL BIOTECHNOLOGY 52 hrs

Course Objectives:

- To teach the theoretical, practical and applied principles & limitations of animal biotechnology.
- To impart knowledge about cell & tissue cultures, molecular biotechnology, recombinant DNA technology, production of transgenic animals, reproductive biotechnology, animal cloning, recombinant vaccines, histochemical techniques and ethical concerns.
- To teach details about the biophysical, biochemical and separation techniques that are currently the bases of molecular biology lab and research work.

Course Learning Outcomes (CLO): After learning the course the student will be :

- Having in-depth knowledge about cell culture techniques used in the laboratory conditions.
- Desiring to take up Research & Development activities.
- Aware about the legal pros & cons of the field.
- Having awareness about advancement in vaccination and DNA derived products for therapeutics.

OET-4.6: ECONOMIC ZOOLOGY 52 hrs

Course objectives:

- Explain plant insect interaction
- Teaching soil and worm interaction
- To make them realize relation between aquaculture and sustainable development
- Narrating significance of poultry and dairy farming to meet nutritional requirement of ever raising human population.

Course Learning Outcomes: Opportunities in terms of employability, entrepreneurship and research.