

DEPARTMENT OF ZOOLOGY

KATWA COLLEGE

Course Outcome (CO) Of CBCS Syllabus

SEMESTER -1

- **Paper CC -1: Non chordates 1**
At the end of the course students will learn about the systematics and biology about non chordates animals and also their body organization. They will also be able to identify invertebrates with appropriate reasons.
- **Paper CC-2: Ecology**
At the end of the syllabus students learn about the environment, ecosystem, population and the interaction between organisms and environment.
- **Paper GE 1: Animal diversity**
At the end of the course students learn about the classification, taxonomy, systematic position of animals & also can differentiate between chordates and non-chordates animal (characters classification, special features etc.)

SEMESTER-2

- **Paper CC -3: Non- chordates II**
At the end of the course students learn about the body organization and systematic position of non -chordates and their identifying characters.
- **Paper CC -4: Cell biology**
At the end of the course students learn about the cell cycle, cell division, cellular structure of animals and also learn about various cellular organelles, structure of plasma membrane, also learn about cancerous cell and apoptosis of cells, cell signalling system.
- **Paper GE 2: Comparative Anatomy & Developmental Biology of Vertebrates**
At the end of the course students will be able to understand the evolutionary & developmental process in vertebrates using comparative analysis of different organ system in different classes of vertebrates.

SEMESTER-3

- **Paper CC-5: Chordates**

At the end of course, students will get knowledge about structures of different systems in comparative way among the vertebrate group. Know about how anatomy relates to an organism's lifestyle, behaviour & survival strategies. Get an insight about evolution of organs in different taxa of vertebrate group.

- **Paper CC-6: Animal Physiology: Controlling and Coordinating Systems**

At the end of the course the students should be able to understand the functional attributes of different organ systems of human body. Also develop the skill to identify different types of blood cells. Also enhance basic laboratory skill like keen observation analysis and discussion.

- **Paper CC-7: Fundamentals of Biochemistry**

At the end of the syllabus, students will Learn about the structure, function & biological importance of Carbohydrate, Lipids, Proteins & Nucleic Acid. Gain knowledge of major metabolic pathways including how energy is produced & utilized in cells. Get an insight into enzyme mechanism & their regulation.

- **Paper SEC-1: Apiculture**

At the end of the syllabus, students will have better idea about the most 'social' insect 'bees', their life cycle, social organization and rearing. Acquire knowledge about diseases and enemies of the bees and also know about the important products of the apiculture industry.

- **Paper GE-3: Physiology and Biochemistry**

At the end of course, learners will get a clear concept about the functional attributes of different organ systems of human body. Also get a clear concept of the structure and reactions of different biomolecules in the living system. Students will develop a deep interest in this subject

SEMESTER-4

- **Paper CC-8: Comparative Anatomy of Vertebrate**
At the end of course, students will get knowledge about structures of different systems in comparative way among the vertebrate group. Know about how anatomy relates to an organism's lifestyle, behaviour & survival strategies. Get an insight about evolution of organs in different taxa of vertebrate group.
- **Paper CC-9: Animal Physiology: Life Sustaining Systems**
At the end of the course the students should be able to understand the functional attributes of different organ systems of human body. Also develop the skill to identify different types of blood cells. Also enhance basic laboratory skill like keen observation analysis and discussion.
- **Paper CC-10: Immunology**
At the end of the syllabus students should be able to understand about immune system & various diseases of human body. Also get knowledge about various type of lymphoid organs, antigen and antibodies, vaccines and complement system etc.
- **Paper SEC-2: Medical Diagnostics**
At the end of course, students will learn about the diagnostic methods for blood and urine analysis. Understand the pathology of infectious and non-infectious diseases and get the concept of tumours. Gather knowledge of various medical imaging techniques.
- **Paper GE-4: Genetics and Evolutionary Biology**
At the end of course, students will understand the basic concepts of genetics and laws of inheritance. Also understand the basics of the origin of life, theories of Evolution, isolation and speciation. They will be able to identify different chromosomal aberrations in man.

SEMESTER-5

- **Paper CC- 11(Molecular Biology)**

At the end of course, students should be able to understand about various types of nucleic acids, molecular mechanisms of Central Dogma, various type of methods involved in molecular biology and also genetic code.

- **Paper CC-12(Genetics)**

At the end of the course, students get knowledge about Mendelian's genetics, Crossing over, sex determination of man, molecular basis of recombination, various types of mutation. Also get knowledge about multiple alleles, various genetic disorders and sex - linked inheritances.

- **Paper DSE-1: Animal Biotechnology**

At the end of the course, students will acquire knowledge of the basic principles, preparations and maintenance protocols required for animal cell culture. Understand the concept of genetically modified organisms & techniques of gene manipulation cell culture and cloning. Also get familiarize with the various tools and techniques of biotechnology.

- **Paper DSE-2: Parasitology**

At the end of the course, students gain knowledge about the basics of parasitology, role of vectors, host-parasite interactions, their life cycles, epidemiology, pathology, diagnosis, symptoms and treatments of various parasites. They will also be able to identify the life cycle stages of some common human parasites.

- **Paper DSE-1A: Applied Zoology**

Understands concepts of fisheries, fishing tools and site selection. Understands about parasites and epidemiology of parasites in human and animals. Understands about biology, control and damage caused by insects. Understanding of parasitic Helminthes. Types of breeds in animal farming and poultry farming along with their management. Aqua culture systems, induced breeding techniques and post harvesting techniques.

- **Paper SEC-3(G): Sericulture**

On completion of the Sericulture course, students will be able to understand overall aspects of Sericulture, namely, Mulberry and non-mulberry silkworms and their food plants, rearing of the silkworm, Silkworm pathology, Process of silkworm seed production and silk technology. This course creates awareness among students about the economic importance and suitability of Sericulture in Indian conditions. Students will learn various technologies involved in Sericulture. Students will get hands-on training on Mulberry nursery management, Silkworm rearing, and Silk reeling.

SEMESTER-6

- **Paper CC-13: Developmental Biology**

At the end of the course, students will get to know about the various aspects of early, late and post embryonic developments. Know about in vitro fertilization and various aspects of stem cell biology including applications of stem cell therapy. They will also be able to identify the developmental stages of *Drosophila* and chick embryo, as well as different invertebrate larvae.

- **Paper CC-14: Evolutionary Biology**

At the end of the course, students will acquire knowledge about the evolutionary history of earth - living and non-living, understanding about evolutionary concepts and theories. They will be able to study the distribution of animals on earth, its pattern, evolution and causative factors. Obtain a core knowledge base in human evolution including a mastery of theoretical and empirical approaches in evolutionary biology, biological anthropology, palaeontology, functional morphology, comparative primate behavioural ecology, population genetics, and modern human variation and adaptation. Demonstrate understanding of ecological and evolutionary processes including the role of genetic variation, heredity, and natural selection as well as the implications these processes have for the origins and evolution of modern humans and their biology. Understand and apply the scientific method and develop critical thinking skills from an evolutionary framework along with the ability to apply knowledge to new information and data, as well as the capacity to effectively communicate the principles of evolution and its application to human biology. The student develops conceptual understanding on Hardy-Weinberg law, founder principle, bottleneck effect and genetic drift, process of Isolating mechanisms, Prezygotic and Postzygotic isolating mechanisms; speciation-allopatric, peripatric, parapatric speciation etc. The student develops appreciation about the major processes involved in the Co-evolution; Microevolution, Macroevolution etc. An enhanced level of conceptual learning regarding Neutral theory of molecular evolution; molecular divergence; molecular drive, Molecular clocks etc.

- **Paper DSE-3: Animal Behaviour**

At the end of the course, students will learn about the patterns of behaviours, social and cooperative behaviours, kinship theories. Understand biological rhythms and the biological clock. Identify nests of birds and insects and study their nesting habits. Study behavioural activities of animals while visiting a field.

- **Paper DSE-4: Endocrinology**

At the end of the course, students learn about the endocrine system, various histological structure of endocrine glands, and also get knowledge about various hormones, their function and the mechanism of hormone actions and various disorders of endocrine glands.

- **Paper DSE-1B: Immunology**

At the end of the course, students will gain basic knowledge about immune cells, immunoglobulins, antigens, MHC molecules, complement systems and cytokines. Distinguish between innate and adaptive immunity & understand various types of hypersensitivities. Know about vaccines and vaccination.

- **Paper SEC 4(G): Community Nutrition and Health Statistics**

At the end of the course, students get knowledge about community, social, political and economical effect of community, pandemic, epidemic, endemic disease such as TB, Malnutrition etc. Also learns about health statistic measurement, probability, health informatics etc.