VIVEKANANDA COLLEGE

TIRUVEDAKAM WEST, MADURAI DISTRICT – 625 234, TAMIL NADU

Vision & Mission and PEOs, PSOs & POs

POST GRADUATE AND RESEARCH DEPARTMENT OF ZOOLOGY

Choice Based Credit System (CBCS)
and
Learning Outcomesbased Curriculum Framework
(LOCF)

Vision

- Unravel hidden research potentials & Entrepreneurial avenues in Zoology
- Bring a behavioural change in Course knowledge, scientific aptitude and instrumental skills to attract students with best caliber
- Raise students to international standards

Mission

- Strategic plans for translating goals and objectives by curriculum design, good teaching methods and evaluation
- Academic and research collaborations
- Biotrack –A forum to update knowledge
- Hands on training at Bio industries

Programme Educational Objectives (PEO)

A graduate of M.Sc. Zoology Programme after five years will

PEO 1	Acquire comprehensive knowledge of Zoology and excel in the chosen area
PEO 2	Develop confidence to prepare for competitive examination
PEO 3	Inculcate to appear higher education
PEO 4	Make the students to develop an aptitude for research
PEO 5	Empower the youth on self employment generation to become an entrepreneur

Programme Outcomes (PO)

On completion (after three years) of M.Sc Zoology Programme, the students are expected to

PO 1	Inculcate knowledge on animal taxonomy, physiological functions and development through practical training and field visit
PO 2	Enhance the study on organization of cell, cell organelles and its function, genetics, evolutionary relations and significance with physiology in molecular level.
PO 3	Develop applications of the techniques and module in biology of biotechnology, bioinformatics, biostatistics, immune assays, lab technology and microbiology.
PO 4	Exploring the animals in human welfare, societal behaviour, diagnosis of disease, ancestry study, system regulations, source as food and genetics and developmental counselling.
PO 5	Acquire entrepreneurial skills and make them to reach self employable.

Course Outcomes (CO)

PART – III **: Core Theory**	Course Code: **31CT11**
Course Title **: BIOCHEMISTRY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire knowledge on classification, structure, properties and importance of biomolecules.	K1, K2 &K5
CO 2	Understand the types of Carbohydrates and metabolic pathways in human.	K2, K4
CO 3	Differentiate the behaviour of amino acids and their metabolic reactions	K3 & K5
CO 4	Remember the importance of fatty acids, phospholipids, Cholesterol and their metabolic reactions in human	K2, K4 & K5
CO 5	Distinguish the structure, biosynthesis and catabolism of purines, pyrimidines and nucleic acids.	K2, K4 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code: **31CT12**
Course Title **: CELL AND MOLECULAR BIOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Understand the structure and molecular organisation of cell membrane, mitochondria and their dynamics	K1 & K3
CO 2	Learn the cell matrices, its functions, detoxifications and recycling	K1, K2, & K5
CO 3	Study the concepts of cell development, its regulation and abnormality	K1 & K3
CO 4	Able to describe the structure of hereditary material, its manifestation and its properties	K1, K2, K3 & K4,
CO 5	Gain knowledge on molecular mechanisms of gene expression and their regulations	K2 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code: **31CT13**
Course Title **: MICROBIOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire knowledge on principles of microbial classification- Bergey's manual, characteristics and morphology of bacteria, fungi, algae, virus and protozoa.	K1 & K2
CO 2	Understand the nutritional requirements, culture media and culture of microbes.	K1, K2 & K3
CO 3	Understand the infectious diseases caused by microbes in man and general concepts of pathogenicity.	K4 & K5
CO 4	Study the diversity and distribution of micro organisms in soil, water, air and their applications.	K1 & K3
CO 5	Differentiate food spoilage, food poisoning by microbes and preservation methods. Industrial application of microbes.	K1, K3, K4, K5,

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Elective Theory**	Course Code: **31EP11**
Course Title **: BIOINFORMATICS**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	They can know the type of computer and their different applications	K1 & K3
CO 2	Operate softwares to construct word process, work sheet and slide preparation and to overcome computer virus..	K2 & K3
CO 3	Describe the content and properties of most important bioinformatics tools, data bases, perform text, sequence based searches and analyse them	K1, K2 & K4
CO 4	Explain principles and execute, pair wise and multiple sequence alignment by dynamic programming.	K1, K3 & K5
CO 5	Predict the primary, secondary, tertiary and quaternary structures of protein sequence. They can also design their template and predict the 3D structures of protein using homology modelling and make them energy minimisation and also validate them	K1, K3 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code**: 31CT21**
Course Title **: IMMUNOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Learn the fundamentals of antigens, antibodies, and diversity of antibodies	K1& K2
CO 2	Acquire knowledge on the types of immune response (humoral and cell mediated) and hypersensitivity reactions	K1 & K3
CO 3	Differentiate the self and non-self immunity, organs transplantation, auto immune diseases, immunology of tumour and AIDS in human	K1, K2 & K5
CO 4	Understand the immune response to protozoan, bacterial and viral infections in human	K2, K4 & K5
CO 5	Empower skill on Immunological techniques	K1, K2 & K3

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code**: 31CT22**
Course Title **: BIOSTATISTICS**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire knowledge on types, classification, tabulation and presentation of data and collection methods. Frequency distribution. Measures of central tendency, Chi-square analysis, probability distributions.	K1 & K2
CO 2	Understand the sampling distribution and sampling methods, students-*t* test and hypothesis testing procedure.	K1, K2 & K3
CO 3	Differentiate and apply correlation and regression analysis in agriculture, medical, environment and research.	K3, K4 & K5
CO 4	Compare the means of more than two samples (between and within) by analysis of variance.	K3, K4 & K5
CO 5	Understand the parameters of vital statistics: natality, mortality, fertility, construction of life table and growth curve in human population.	K2, K3, K4 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code: **31CT23**
Course Title **: DEVELOPMENTALBIOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire knowledge on spermatogenesis, oogenesis, fertilization, egg activation and parthenogenesis.	K1 & K2
CO 2	Understand the reproductive cycle, menstruation, ovulation, embryo development, extra embryonic membrane, placenta in human.	K1 & K2
CO 3	Distinguish the organizer concept, gradient theory and nuclear transplantation based on experiments.	K3, K4 & K5
CO 4	Differentiate the molecular aspects of cell differentiation, chemo differentiation, stem cells and gene action.	K1, K3, K4
CO 5	Have knowledge on metamorphosis and regeneration in amphibians	K1, K2, K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Elective Theory**	Course Code**: 31EP21**
Course Title **: EVOLUTION**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Study the modern concepts of natural selection	K1, K2
CO 2	Imparting knowledge on molecular evolution from amino acid-protein –DNA phylogeny	K1, K2, K3
CO 3	Understand species concept and distribution of animals	K2, K5
CO 4	Trace the origin of higher taxa and its deviation	K2, K3, K4, K5
CO 5	Understand fossil history of early man, biological and cultural evolution of man	K2, K3, K4, K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code**: 31CT31**
Course Title **: GENETICS**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire knowledge on gene concepts and animal heredity	K1, K2 &K5
CO 2	Impart knowledge on organisational genetics of bacteria and gene transfer methods.	K2, K4
CO 3	Develop knowledge on genetic organisation, multiplication and replication of virus.	K3 & K5
CO 4	Trace the various gene mutation, repair mechanisms and various types of recombination.	K2, K4 & K5
CO 5	Understand the molecular basis of human cancer and apply the techniques to improve human race.	K2, K4 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code**: 31CT32**
Course Title **: PHYSIOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire knowledge on structure, physiology and mechanism of respiratory system.	K1, K2 &K5
CO 2	Trace the knowledge on physiology of receptors and biophysical implications.	K2, K4
CO 3	Gain the knowledge on the functions and regulations of respiratory, circulatory systems.	K3 & K5
CO 4	Explore the organisation of nervous system, their functions and behaviour.	K2, K4 & K5
CO 5	Acquire knowledge on blood components and its physiology	K2, K4 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code**: 31CT33**
Course Title **: PRINCIPLES OF BIOTECHNOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Inculcate knowledge on scenario, safety and social ethical issues on biotechnology and also methods of obtaining patent.	K1, K2 &K5
CO 2	Enable the students to gain the knowledge on various types and actions of molecular enzymes and markers.	K2, K4
CO 3	Understand the cloning and expression vector types and their role in gene therapy	K3 & K5
CO 4	Explore the techniques of sequencing and identification of DNA, RNA and proteins and their applications	K2, K4 & K5
CO 5	Trace the skills of gene transfer, construction of clones, genomic libraries and their screening strategies.	K2, K4 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Non-Major Elective**	Course Code: **31NE31**
Course Title **: ECONOMIC ZOOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire knowledge on characteristics, biology, process and applications of earthworms in organic farming.	K1, K2 &K5
CO 2	Understand the knowledge on races of honey bee, bionomics, bee keeping methods, diseases and its products and economic importance.	K2, K4
CO 3	Impart knowledge on moriculture, types and biology of silkworm, rearing methods and diseases.	K3 & K5
CO 4	Obtain knowledge on biology, characteristics and disease of Indian major carps, Ornamental fishes and artificial spawning techniques.	K2, K4 & K5
CO 5	Trace the deeper knowledge on characteristics, feeding and breeding methods of dairy.	K2, K4 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code**: 31CT41**
Course Title **: APPLIED BIOTECHNOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Enhance knowledge on molecular biotechnological approaches and biomaterials in human diseases, diagnosis, therapy and treatment.	K1, K2 &K5
CO 2	Develop knowledge on animal reproduction, alternative techniques including stem cells and cloning.	K2, K4
CO 3	Acquire cloning knowledge on the applications of plant tissue culture, GM food, bio insecticides and bio fertilizers.	K3 & K5
CO 4	Trace the properties, characteristics, synthesis and applications of Nano particles.	K2, K4 & K5
CO 5	Create application knowledge on waste management, remediation techniques and bioenergy productions.	K2, K4 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Core Theory**	Course Code**: 31CT42**
Course Title **: ENVIRONMENTAL BIOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire knowledge on concepts and dynamics of ecosystem, biodiversity and its conservation methods.	K1, K2 &K5
CO 2	Impart knowledge on origin and status of natural resources, conservations, deterioration effects and its alternate remedies.	K2, K4
CO 3	Enhance the knowledge on toxicants, effects, radioactive materials, nuclear reactors, its hazards and remedies.	K3 & K5
CO 4	Explore the concepts of dwelling structures, characteristics of human in rural, urban, slum and in space.	K2, K4 & K5
CO 5	Understanding concision on environment through education programmes, laws, national and international bodies.	K2, K4 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing

PART – III **: Elective Theory**	Course Code**: 31EP41**
Course Title **: BIO-FARMING TECHNOLOGY**	

On the successful completion of the course, students will be able to

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire knowledge on characteristics, biology, culture methods and applications of earthworms in organic farming.	K1, K2 &K5
CO 2	Understand the knowledge on races of honey bee, bionomics, bee keeping methods, diseases and its products and economic importance.	K2, K4
CO 3	Impart knowledge on moriculture, types and biology of silkworm, rearing methods, diseases, grainage and silk technology.	K3 & K5
CO 4	Obtain knowledge on biology, characteristics and disease of Indian major carps, Ornamental fishes and artificial spawning techniques.	K2, K4 & K5
CO 5	Trace the deeper knowledge on characteristics, feeding and breeding methods of dairy and poultry.	K2, K4 & K5

K1- Remembering K2-Understanding K3-Applying K4-Analyzeing