Government Arts College for Men, Krishnagiri-635001

PG & Research Department of Zoology

Program Outcome

B.Sc Zoology

2015-16

Programme Outcomes

Name of the Programme	:	B.Sc. Zoology
Academic Frame Work & Content	:	Following / Adhering to the Curriculum, syllabus and evaluation system designed by Periyar University, Salem-7, Tamilnadu

Programme specific outcomes

FIRST SEMESTER

Core Paper I

INVERTEBBRATA I

Learning Objectives:

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

- Describe the distinguishing characteristics of the major taxa
- Explain the basic aspects of classification details of invertebrates
- Understand biodiversity, habitat, adaptation organization and taxonomic status of invertebrates
- Recall certain morphological attributes and physiological processes that are distinct and significant to each Phyla
- Understand the systemic and functional morphology of various groups of invertebrates
- Explain the basic aspects of structural and functional details of Invertebrates

Learning Outcomes:

- To compare and understand the general and specific characteristics within each Phyla
- Interpret the affinities, evolutionary relationships and adaptation of the major taxa and to explain their• economic importance with respect to Non-Chordates.

SECOND SEMESTER

Core Paper II

CHORDATA

Learning Objectives:

To understand what the chordates are.

- To understand the taxonomic position of chordates.
- To understand different categories of chordates.
- To understand the general characters of chordates.
- To understands the level of organization in chordate subphylum.
- To understand the origin and evolutionary relationship in different subphylum of chordates.

Learning Outcomes:

- This course will be helpful to student to have overall understanding of various chordates.
- Describe unique characters of urochordates, cephalochordates and fishes.
- Recognize life functions of urochordates to fishes. ➢Understand the ecological role of different groups of chordates.
- The knowledge gained from this subject will be helpful for students to realize the significance of Animal Sciences.

COREPRACTICAL - I

INVERTEBRATES& CHORDATA

Learning Objectives:

The student will demonstrate an understanding of, and be able

- To identify in detail, the anatomical characteristics of members of Invertebrates and phylum Chordata
- To classify of the ontogenic and phylogenic relationships of Invertebrates and phylum Chordata.

Learning Outcomes:

- Training experience in anatomy through simple dissection and mounting.
- Familiarization with conventional organ system in different animals.
- Identify and study preserved specimens of various economically important animals.

SEMESTER – III

CORE COURSE -III

CELL BIOLOGY

Learning Objectives:

- To understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles
- To understand how these cellular components are used to generate and utilize energy in cells
- To understand the cellular components underlying mitotic cell division.
- To understand responses to environmental or physiological changes, or alterations of cell function brought about by mutation.
- To understand the process of cell division in both somatic and germ cell.

Learning Outcomes:

Able to describe the function and the composition of the plasma membrane.

- Able to explain the principles of the cell theory.
- Able to Differentiate between prokaryotes and eukaryotes.
- Able to understand the importance of the nucleus and its components.
- Able to understand how the endoplasmic reticulum and Golgi apparatus interact with one another and know with which other organelles they are associated.
- Able to identify the three primary components of the cell‟s cytoskeleton and how they affect cell shape, function, and movement.

SBEC-I

VERMICULTURE AND VERMICOMPOSTING

Learning Objectives:

- To recall and recognize earthworm diversity.
- To get knowledge on organic farming and waste management using vermitechnology.
- To understand the vermiculture techniques.
- To apply knowledge on vermicompost preparation
- To aware the significance of sustainable agriculture and organic farming.
- To inoculate basic knowledge on recycling of biodegradable waste of different kinds.
- To understand the value of Vermitechnology and its significance.
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Learning Outcomes:

- Get knowledge about the characteristics and role of earthworm in sustainable agriculture.•
- Get knowledge on the significance of earthworms.
- Understand the importance of waste degradation by eco-friendly method.
- Apply the significance of Vermicomposting methods.
- Apply knowledge on commercialization of Vermiproducts.
- Expertise in Vermiculture Techniques
- Creating Opportunities for self employment

NMEC-I

HUMAN HEALTH AND HYGIENE

Learning Objectives:

On the completion of the course the learner will be able to,

- understand the classification of nutrients
- gain knowledge on the intake of balanced diet and the significance of food list the common deficiency disorders, their causes, symptoms and recommended food sources
- evaluate the importance of a balanced diet
- Understand the types of abuses and associated behavioural changes.
- Know the causes for drug, tobacco and alcohol addiction and its effects on health.
- Analyze the possible ways of de-addiction.
- Know about the diseases and disorders associated with lifestyle modification.
- Explain the underlying cause and symptoms for diabetes, obesity, cancer and AIDS.

Learning Outcomes:

After the completion of the course the student will be to,

- Get an opportunity to work in the field of health department, NGOs.
- Do higher learning in the area of Paramedical courses.
- Confirm the quality and standards of water, air, light, sound.
- Suggest remedial measures for prevention and control of these diseases and disorders.
- Create awareness among the individuals in the society to lead healthy life

SEMESTER -IV

CORE COURSE - IV:

GENETICS

Learning Objectives:

- To know how the behavior of chromosomes during meiosis can explain by Mendel‟s law.
- To understand how inheritance patterns are affected by position on chromosomes.
- To make out the similarities and differences between how genetic information is passed on in prokaryotes and eukaryotes.
- To understand gene interactions.
- To understand the chemical nature of heredity.

Learning Outcomes:

- Comprehensive and detailed understanding of the chemical basis of heredity.
- Understanding about the role of genetics in evolution.
- The ability to evaluate conclusions that are based on genetic data.
- The ability to understand results of genetic experimentation in animals.

SBEC II

DAIRY SCIENCE

Learning Objectives:

- To explore the Farming of Dairy Breeds
- To understand the methodology of construction of Dairy Farming
- To get employment in the Cooperative Milk Producers Union Limited and in private dairy product factories
- To provide knowledge to give them an opportunity and its socio-economic aspects
- To train and impart practical knowledge in clean milk production, processing of milk and preparation of milk products
- To Study of various diseases and disorders in Dairy breeds and First Aid Measures
- To create the aware the students about the Cattle disease and its treatment

Learning Outcomes:

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

- Impart technical knowledge and skills required concerning the selection and breeding of dairy cattle, management of animals and different physiological status, nutrition, health, housing and feeding.
- Principles and practices essential in the production of clean milk. Able to classify feeds according to their nutritive values. Students will know the different types of microbes, and diseases. Completion of the programme may seek employment in private dairy farm, milk processing plants and¬ dairy product factories.

AQUACULTURE

Learning Objectives:

- To know the basic principles of aquaculture farming.
- To acquire the knowledge about the water quality parameters.
- To understand the function of individual nutritive components.
- To know the cultivable fish production for sustainable aquaculture farming.
- To study the microbial infective defence mechanism and their disease management.

Learning Outcomes:

- Familiarize the importance of aquaculture practices.
- Acquired the technology enabled sustainable aquaculture farm management.
- Gained knowledge of nutritive importance in feed formulation
- Obtained knowledge in the economical aspects of the aquaculture.
- Relate the strategies learned for the development of Aquafarm management and sustainable production.
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NMEC-II

WILDLIFE MANAGEMENT

Learning Objectives:

- On the completion of the course the student will be able to
- Know the basic concept and principles of Wildlife Management
- Understand the Evaluation of Wild life habitat
- Know population estimation
- Analyse Human – animal conflicts
- Realise Zoo‟s Zoological Parks, Wildlife sanctuaries, National Parks and Tiger reserves

Learning Outcomes:

- Understand the various concepts ofWild life Management
- Write Competitive Examinations

CORE PRACTICAL - II

CELL BIOLOGY, GENETICS, VERMICULTURE & VERMICOMPOSTING, DAIRY SCIENCE &AQUACULTURE

Learning Objectives:

Students will be able,

- Measure through micrometry techniques.
- Count blood cells by using hemocytometer.
- Observe living cells• Identification of drosophila mutants.
- Study about Normal Karyotyping
- Prepare and observe chromosomal arrangements during cell division. to compost in a limited space and describe the decomposing process.
- They will also turn towards organic farming,
- Will help to maintain the environment pollution free and
- Will get the knowledge of biodiversity of local earthworms.
- To successfully run a dairy farm enterprise by developing competencies concerning the selection and breeding of dairy cattle, management of animals of different physiological status, nutrition, health, housing and feeding.
- To provide hands-on experiences with the principles and practices essential in the production of clean milk for personal economic development.
- To give the students the necessary basic information about fishery and aquaculture.
- To discuss aquatic food primary production systems, fishery and aquaculture.
- To discuss important factors for performing a sustainable fishery and a sustainable aquaculture

Learning Outcomes:

Basic knowledge on applications to different cell studies.

- Understands the fundamental genetic studies.
- Understands concepts of fisheries, fishing tools and site selection
- Knowledge on Aquaculture systems, induced breeding techniques, post harvesting techniques

- Provides knowledge of ornamental fish breeding which is highly professional and attractive avenue for youth
- Students will get the self-employment with the help of vermitechnology, Dairy Science and Aquaculture
- They can generate employments by vermitechnology, Dairy Science and Aquaculture

SEMESTER -V

CORE COURSE- V

ANIMAL PHYSIOLOGY

Learning Objectives:

- To understand the structure of the different organ systems in man/mammals.
- To understand the mechanisms involved in the functioning of the different systems.
- To study certain disorders that arise as a consequence of physiological malfunction.
- To understand the metabolic activities in mammalian body.
- To understand the gaseous transport and the structure involved in gaseous transport in mammalian body.
- To understand the various biomolecules in body.
- To understand the types mechanism of working of nerve cells.
- To understand the nature of endocrine glands and their secretion.

Learning Outcomes:

- Students are able to understand the physiology at cellular and system levels.
- Students are able to describe the role and functions of different systems.
- Able to describe the physiology of respiratory, renal, endocrine systems to define normal and abnormal functions.

CORE COURSE - VI

DEVELOPMENTAL BIOLOGY

Learning Objectives:

- On completion of the course, students should be able to
- Remember the basic concepts and definitions of modern developmental biology
- Understand steps and advancements in the developmental biology
- Comprehend embryonic formation and developmental stages with suitable examples
- Apply functional knowledge on developmental biology into frontier
- Analyze animal embryonic development and possibilities of birth control

Learning Outcomes:

- After the completion of the course, students should be able to
- Develop critical understanding how a single-celled fertilized egg becomes an embryo and then a fully formed adult by going through three important processes of cell division, cell differentiation and morphogenesis.
- Understand how developmental processes and gene functions within a particular tissue or organism can provide insight into functions of other tissues and organisms.
- Realize that very similar mechanisms are used in very diverse organisms; and development is controlled through molecular changes resulting in variation in the expression and function of gene networks.
- Understand the relevance of developmental biology in medicine or its role in development of diseases.

CORE COURSE - VII

IMMUNOLOGY AND MICROBIOLOGY

Learning Objectives:

- To understand the concept of immunity and its constituent types.
- To study the lymphoid organs, the cells of the immune system and the effector molecules namely, antigens and antibodies.
- To study the clinical manifestations of immunological disorders.
- To appreciate the diversity of microbes and significance of certain microbes that are associated with man

Learning Outcomes:

- Imparts in depth knowledge of tissues, cells and molecules involved in host defense mechanisms Understanding of types of immunity
- Interactions of antigens, antibodies, complements and other immune components
- Understanding of immune mechanisms in disease control, vaccination, process of immune interactions
- Classification of microorganisms.
- Understanding of pathology of diseases caused by various microorganisms such as bacteria, virus, parasites and fungus

ELECTIVE PAPER-I

BIO-INFORMATICS, BIOSTATISTICS AND COMPUTER APPLICATIONS

Learning Objectives:

- To introduce the basics of bioinformatics biological databases, retrieval tools and applications.
- To understand data collection, data handling and data analysis.
- To understand computer components, certain MS Office applications, internet search engines and computer viruses.

Learning Outcomes:

- Basics of bioinformatics- biological databases, retrieval tools and applications.
- Collection, Handling, Analysis of biological data.
- Student's gains knowledge about statistical methods like measures of central tendencies.
- Computer applications in biological data / statistical methods

SBEC - IV

POULTRY SCIENCE

Learning Objectives:

- To explore the cultivation of poultry
- To understand the methodology of construction of poultry house
- To create the aware the students for about the poultry disease and its treatment
- To make the learner well aware of various methods in Poultry Science and its management.
- To train the students to undertake Poultry farming as income source.

Learning Outcomes:

- Students in Poultry Science study the nutrition, marketing, management and business skills needed in poultry production.
- Poultry Science students receive a foundation in basic sciences and mathematics, as well as un understanding of the poultry industry.

SBEC -V

MEDICAL LABORATORY TECHNIQUES (MLT)

Learning Objectives:

- To make the knowledge about medical laboratory instruments and its uses.
- To teach the method and collection of samples and its importance.
- To make aware the students during the emergency situation.
- To learn the blood sample collection and its cells counting.
- To learn the techniques used in the Clinical laboratory for sample analysis.
- To create knowledge on Self-Employment Opportunity.

Learning Outcomes:

- Understand fundamental analytical principles and processes used in clinical laboratory testing for various specimens.
- Understand the concepts and safety measures of clinical laboratory instruments.
- Acquired technical skills will help the students for collecting and processing biological specimens for analysis.
- Application of medical laboratory procedures will enable the students to distinguish normal and abnormal microscopic pathogens.
- Students enable their critical and analytical thinking in the detection of diseases.
- Interpretation will empower students to compare and contrast clinical laboratory procedures, interpret¬ data and predict diagnosis.

SEMESTER -VI

CORE COURSE -VIII

ENVIRONMENTAL BIOLOGY

Learning Objectives:

- To understand the basic ecological concepts.
- To learn the importance of environment and its related components.
- To attain the knowledge about the ecosystem and its characteristics.
- To develop an awareness of pollution and importance of environmental resources.
- To obtain the knowledge about the conservation of biodiversity

Learning Outcomes:

- Acquire the ecological knowledge and its biological significance.
- Understand the differences in the structure and function of ecosystems.
- Learn the ways of interactions of living and non-living organisms with the environment.
- Identify the problems of environment and analyzing its impact on biodiversity.
- The importance of hotspots, sanctuaries and their role in protecting biodiversity.

CORE COURSE –IX

ETHOLOGY

Learning Objectives:

- To understand why animals behave the way they do.
- To understand the cause of behavior.
- To understand how behavior develops.
- To explain both phylogenetically and physiologically the functional relationships of all factors involved in behavior.

Learning Outcomes:

- The range of behavior prevalent in the animal kingdom starting from innate to learned behavior, from fighting to cooperating etc.
- For effective management of game animals.
- Must be aware of habits of his / her animals to get maximum benefit.
- The cattle breeding, poultry, piggery, fishery, sericulture etc. have been developed as industries for the benefit of mankind, only after understanding the behavior of the respective animals.
- Man may want to keep pets for recreation.
- For healthy pet management it is essential to understand the behavior.
- The information and the insight gathered in animal behavior can be used to understand human behavior. Behavioral studies can help in animal conservation.
- By understanding the nesting and territorial habits of the birds can help to create or preserve the habitats required by them. It can also help to increase the number of endangered and threatened animals

CORE COURSE - X

EVOLUTIONARY BIOLOGY

Learning Objectives:

- On the completion of the course the student will be able to Identify the Origin of life.
- Relate the existing evidences of evolution with the process of evolution.
- Analyze critically the Evolutionary theories with examples.
- Understand the Patterns of Evolution
- Summarize the concept of species, mechanisms of speciation.
- Appreciate the evolution of man.
- Defend Animal distribution.

Learning Outcomes:

- After the completion of the course the student will be to
- Students are able to describe various biological interactions.
- Able to describe evolutionary history of man
- Able to describe origin of species on earth.
- Write competitive examinations like GATE / UPSC / TNPSC.
- Get an opportunity to work in the field of forensic science, Museum, Archeology.
- Do higher learning in the area of anthropology.

ELECTIVE COURSE – III

SERICULTURE

Learning Objectives:

- To know the history and socio-economical aspects of sericulture.
- To understand the classification and morphology of silkworm+.
- To obtain the knowledge about the description of Mulberry cultivation and pest management.
- To attain the knowledge about the disease management in sericulture.
- To understand the methodology followed for the reeling and rearing of sericulture

Learning Outcomes:

- Describe the economic impacts and income generation by sericulture.
- Educate the students about the basic biology of Mulberry culture.
- Expertise in the taxonomy, morphology and life cycle of the silkworm.
- Relate the strategies involved in the sericulture management system.
- Acquired the knowledge about the technologies in sericulture.

SBEC - VI

APICULTURE

Learning Objectives:

- Understand the basic life cycle of the honeybee. Learn about beekeeping tools and equipment.
- Learn to manage beehives for honey production and pollination.
- Learn about bee diseases and pests.

Learning Outcomes:

- Encourage Students‟ participation in scientific beekeeping.
- Maintain ecological balance in nature by way of domestication of honey bee species.
- Maintain small apiaries for demonstration, pollination, extraction and popularization of honey and other by-product of beekeeping.
- Motivation of students to adopt beekeeping as source of their livelihood.

CORE PRACTICAL – III

ANIMAL PHYSIOLOGY, DEVELOPMENTAL BIOLOGY, IMMUNOLOGY & MICROBIOLOGY, BIOINFORMATICS, BIOSTATISTICS AND COMPUTER APPLICATIONS, POULTRY SCIENCE&MLT.

Learning Objectives:

- To empower our students with practical skills to comprehend the Physiology and other functions of each and every vital systems.
- Identify experimental approaches in developmental biology.
- Recognise sources of error in experimental approaches in developmental biology.
- Analyse, compare, assess and evaluate experimental data in the field of developmental biology.
- To familiarize the student with principles of clinical microbiology,immunology, routine methods of identification of bacteria &study of common parasites of man
- To give the students a sound knowledge of pathogenic microbes, laboratory diagnosis, basic understanding of virology, mycology,& advanced serological techniques.
- Apply the knowledge to collect various Biological data and using statistical applications.
- Familiar with various Applications of Bioinformatics
- Understand practical knowledge on poultry science.
- Computer applications on biological data.•

Learning Outcomes:

- Students are able to do experiment on the role and functions of different systems.
- Able to describe the physiology of respiratory, renal, endocrine and reproductive systems to define normal and abnormal functions.
- Students are able to understand how physiological parameters are measured in mammals. Be able to list the types of characteristics that make an organism ideal for the study of developmental biology. Be familiar with the events that led up to fertilization.
- Be able to observe the first four rounds of cell division in different groups.
- Be able to identify the stages and cellular mechanisms for gastrulation.
- Demonstrate various types of Eggs Learn about various types of Placenta
- Develop skill in observing sperm motility
- Apply the computer knowledge to collect various Biological data
- Familiar with various Applications of Bioinformatics

- Get awareness about nature of the emerging digital knowledge society
- Students will gain skill to execute the roles of a biology teacher or medical lab technicians with training as they have basic fundamentals
- To impart awareness on Clinical Lab Technology
- To create knowledge on Self-Employment Opportunity by area of poultry science and MLT

CORE PRACTICAL – IV

ENVIRONMENTAL BIOLOGY, ETHOLOGY, EVOLUTIONARY BIOLOGY, SERICULTURE AND APICULTURE.

Learning Objectives:

- To inculcate the practical knowledge on moriculture and sericulture
- To know the importance of silkworm rearing, pests and diseases of silkworms and their control• measures To analyze the quality of silk through experiments
- To identify the honey bee species, races and castes
- To understand the behavior and physiology of honey bees
- To know the importance of honey bees and hive products
- To develop knowledge about value added products in honey

Learning Outcomes:

- Ability to Estimate of dissolved oxygen, Salinity, pH, free
- Carbonates and Bicarbonates, Calcium in water samples.
- Familiar with ecological adaptations
- Measure pH of different water samples using pH meter, pH paper and indicator solution.
- Demonstrate Alarm pheromones in ants.
- Identify the contributions of various evolutionists.
- Identify different zoogeographical realms with fauna.
- Apply knowledge on moriculture and sericulture
- Observe the biology, rearing, pests and diseases of silkworm and their control measures
- Evaluate the quality of silk
- Supply knowledge in identifying honey bee species, races and castes
- Field visit to study the apiary management techniques and honey harvesting methods
- Demonstrate the students for value added products in honey

B.Sc. ALLIED ZOOLOGY

ODD SEMESTER PAPER – I:

NON–CHORDATA AND CHORDATA

Learning Objectives:

- To appreciate the diversity of the animal kingdom.
- To understand characteristics of the non-chordate phyla and the chordate classes.
- To study the organization and life cycle of certain economically significant organisms.

Learning Outcomes:

- Get awareness on animal diversity
- Understand the affinities among the animals.
- Apply on zoology knowledge on further higher learning of other subjects.

PAPER – II:

GENERAL PRINCIPLES OF ZOOLOGY

Learning Objectives:

- Understand the structure of the cell and its functions Study the development of animals
- Analyse the physiology and functions of different organs
- Know environmental problems• Deploy the concepts of evolution

Learning Outcomes:

- Realisethe various cell structure, organelles,
- Gain Knowledge regarding genetic disorders, developmental process, physiological functions,
- Environmental aspects and evolutionary process.
- Applied knowledge for higher learning and occupational needs.

B.SC. ALLIED ZOOLOGY PRACTICALS

ODD & EVEN SEMESTER

NON – CHORDATA, CHORDATA AND GENERAL PRINCIPLES OF ZOOLOGY

Learning Objectives:

- To get anatomical knowledge and adaptations in animal group.
- To identify model animals as specimen / slides.
- To provide skill of drawing and labelling.
- To appreciate economic zoology for its importance.

Learning Outcomes:

- Getting fundamental knowledge on animal groups.
- Acquired skill of dissection, drawing and labelling.
- Awareness on economic value

Government Arts College for Men, Krishnagiri-635001

PG & Research Department of Zoology

Program Outcome

B.Sc Zoology

2016-17

Programme Outcomes

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Academic Frame Work & Content	:	Following / Adhering to the Curriculum, syllabus and evaluation system designed by Periyar University, Salem-7, Tamilnadu

Programme specific outcomes

FIRST SEMESTER

Core Paper I

INVERTEBBRATA I

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- Recall certain morphological attributes and physiological processes that are distinct and significant to each Phyla
- Understand the systemic and functional morphology of various groups of invertebrates
- Explain the basic aspects of structural and functional details of Invertebrates

Learning Outcomes:

- To compare and understand the general and specific characteristics within each Phyla
- Interpret the affinities, evolutionary relationships and adaptation of the major taxa and to explain their• economic importance with respect to Non-Chordates.

SECOND SEMESTER

Core Paper II

CHORDATA

Learning Objectives:

To understand what the chordates are.

- To understand the taxonomic position of chordates.
- To understand different categories of chordates.
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Learning Outcomes:

- This course will be helpful to student to have overall understanding of various chordates.
- Describe unique characters of urochordates, cephalochordates and fishes.
- Recognize life functions of urochordates to fishes. ➢Understand the ecological role of different groups of chordates.
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COREPRACTICAL - I

INVERTEBRATES& CHORDATA

Learning Objectives:

The student will demonstrate an understanding of, and be able

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- To classify of the ontogenic and phylogenic relationships of Invertebrates and phylum Chordata.

Learning Outcomes:

- Training experience in anatomy through simple dissection and mounting.
- Familiarization with conventional organ system in different animals.
- Identify and study preserved specimens of various economically important animals.

SEMESTER – III

CORE COURSE -III

CELL BIOLOGY

Learning Objectives:

- To understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles
- To understand how these cellular components are used to generate and utilize energy in cells
- To understand the cellular components underlying mitotic cell division.
- To understand responses to environmental or physiological changes, or alterations of cell function brought about by mutation.
- To understand the process of cell division in both somatic and germ cell.

Learning Outcomes:

Able to describe the function and the composition of the plasma membrane.

- Able to explain the principles of the cell theory.
- Able to Differentiate between prokaryotes and eukaryotes.
- Able to understand the importance of the nucleus and its components.
- Able to understand how the endoplasmic reticulum and Golgi apparatus interact with one another and know with which other organelles they are associated.
- Able to identify the three primary components of the cell‟s cytoskeleton and how they affect cell shape, function, and movement.

SBEC-I

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- To apply knowledge on vermicompost preparation
- To aware the significance of sustainable agriculture and organic farming.
- To inoculate basic knowledge on recycling of biodegradable waste of different kinds.
- To understand the value of Vermitechnology and its significance.
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Learning Outcomes:

- Get knowledge about the characteristics and role of earthworm in sustainable agriculture.•
- Get knowledge on the significance of earthworms.
- Understand the importance of waste degradation by eco-friendly method.
- Apply the significance of Vermicomposting methods.
- Apply knowledge on commercialization of Vermiproducts.
- Expertise in Vermiculture Techniques
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NMEC-I

HUMAN HEALTH AND HYGIENE

Learning Objectives:

On the completion of the course the learner will be able to,

- understand the classification of nutrients
- gain knowledge on the intake of balanced diet and the significance of food list the common deficiency disorders, their causes, symptoms and recommended food sources
- evaluate the importance of a balanced diet
- Understand the types of abuses and associated behavioural changes.
- Know the causes for drug, tobacco and alcohol addiction and its effects on health.
- Analyze the possible ways of de-addiction.
- Know about the diseases and disorders associated with lifestyle modification.
- Explain the underlying cause and symptoms for diabetes, obesity, cancer and AIDS.

Learning Outcomes:

After the completion of the course the student will be to,

- Get an opportunity to work in the field of health department, NGOs.
- Do higher learning in the area of Paramedical courses.
- Confirm the quality and standards of water, air, light, sound.
- Suggest remedial measures for prevention and control of these diseases and disorders.
- Create awareness among the individuals in the society to lead healthy life

SEMESTER -IV

CORE COURSE - IV:

GENETICS

Learning Objectives:

- To know how the behavior of chromosomes during meiosis can explain by Mendel‟s law.
- To understand how inheritance patterns are affected by position on chromosomes.
- To make out the similarities and differences between how genetic information is passed on in prokaryotes and eukaryotes.
- To understand gene interactions.
- To understand the chemical nature of heredity.

Learning Outcomes:

- Comprehensive and detailed understanding of the chemical basis of heredity.
- Understanding about the role of genetics in evolution.
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DAIRY SCIENCE

Learning Objectives:

- To explore the Farming of Dairy Breeds
- To understand the methodology of construction of Dairy Farming
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- To provide knowledge to give them an opportunity and its socio-economic aspects
- To train and impart practical knowledge in clean milk production, processing of milk and preparation of milk products
- To Study of various diseases and disorders in Dairy breeds and First Aid Measures
- To create the aware the students about the Cattle disease and its treatment

Learning Outcomes:

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

- Impart technical knowledge and skills required concerning the selection and breeding of dairy cattle, management of animals and different physiological status, nutrition, health, housing and feeding.
- Principles and practices essential in the production of clean milk. Able to classify feeds according to their nutritive values. Students will know the different types of microbes, and diseases. Completion of the programme may seek employment in private dairy farm, milk processing plants and¬ dairy product factories.

AQUACULTURE

Learning Objectives:

- To know the basic principles of aquaculture farming.
- To acquire the knowledge about the water quality parameters.
- To understand the function of individual nutritive components.
- To know the cultivable fish production for sustainable aquaculture farming.
- To study the microbial infective defence mechanism and their disease management.

Learning Outcomes:

- Familiarize the importance of aquaculture practices.
- Acquired the technology enabled sustainable aquaculture farm management.
- Gained knowledge of nutritive importance in feed formulation
- Obtained knowledge in the economical aspects of the aquaculture.
- Relate the strategies learned for the development of Aquafarm management and sustainable production.
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NMEC-II

WILDLIFE MANAGEMENT

Learning Objectives:

- On the completion of the course the student will be able to
- Know the basic concept and principles of Wildlife Management
- Understand the Evaluation of Wild life habitat
- Know population estimation
- Analyse Human – animal conflicts
- Realise Zoo‟s Zoological Parks, Wildlife sanctuaries, National Parks and Tiger reserves

Learning Outcomes:

- Understand the various concepts ofWild life Management
- Write Competitive Examinations

CORE PRACTICAL - II

CELL BIOLOGY, GENETICS, VERMICULTURE & VERMICOMPOSTING, DAIRY SCIENCE &AQUACULTURE

Learning Objectives:

Students will be able,

- Measure through micrometry techniques.
- Count blood cells by using hemocytometer.
- Observe living cells• Identification of drosophila mutants.
- Study about Normal Karyotyping
- Prepare and observe chromosomal arrangements during cell division. to compost in a limited space and describe the decomposing process.
- They will also turn towards organic farming,
- Will help to maintain the environment pollution free and
- Will get the knowledge of biodiversity of local earthworms.
- To successfully run a dairy farm enterprise by developing competencies concerning the selection and breeding of dairy cattle, management of animals of different physiological status, nutrition, health, housing and feeding.
- To provide hands-on experiences with the principles and practices essential in the production of clean milk for personal economic development.
- To give the students the necessary basic information about fishery and aquaculture.
- To discuss aquatic food primary production systems, fishery and aquaculture.
- To discuss important factors for performing a sustainable fishery and a sustainable aquaculture

Learning Outcomes:

Basic knowledge on applications to different cell studies.

- Understands the fundamental genetic studies.
- Understands concepts of fisheries, fishing tools and site selection
- Knowledge on Aquaculture systems, induced breeding techniques, post harvesting techniques

- Provides knowledge of ornamental fish breeding which is highly professional and attractive avenue for youth
- Students will get the self-employment with the help of vermitechnology, Dairy Science and Aquaculture
- They can generate employments by vermitechnology, Dairy Science and Aquaculture

SEMESTER -V

CORE COURSE- V

ANIMAL PHYSIOLOGY

Learning Objectives:

- To understand the structure of the different organ systems in man/mammals.
- To understand the mechanisms involved in the functioning of the different systems.
- To study certain disorders that arise as a consequence of physiological malfunction.
- To understand the metabolic activities in mammalian body.
- To understand the gaseous transport and the structure involved in gaseous transport in mammalian body.
- To understand the various biomolecules in body.
- To understand the types mechanism of working of nerve cells.
- To understand the nature of endocrine glands and their secretion.

Learning Outcomes:

- Students are able to understand the physiology at cellular and system levels.
- Students are able to describe the role and functions of different systems.
- Able to describe the physiology of respiratory, renal, endocrine systems to define normal and abnormal functions.

CORE COURSE - VI

DEVELOPMENTAL BIOLOGY

Learning Objectives:

- On completion of the course, students should be able to
- Remember the basic concepts and definitions of modern developmental biology
- Understand steps and advancements in the developmental biology
- Comprehend embryonic formation and developmental stages with suitable examples
- Apply functional knowledge on developmental biology into frontier
- Analyze animal embryonic development and possibilities of birth control

Learning Outcomes:

- After the completion of the course, students should be able to
- Develop critical understanding how a single-celled fertilized egg becomes an embryo and then a fully formed adult by going through three important processes of cell division, cell differentiation and morphogenesis.
- Understand how developmental processes and gene functions within a particular tissue or organism can provide insight into functions of other tissues and organisms.
- Realize that very similar mechanisms are used in very diverse organisms; and development is controlled through molecular changes resulting in variation in the expression and function of gene networks.
- Understand the relevance of developmental biology in medicine or its role in development of diseases.

CORE COURSE - VII

IMMUNOLOGY AND MICROBIOLOGY

Learning Objectives:

- To understand the concept of immunity and its constituent types.
- To study the lymphoid organs, the cells of the immune system and the effector molecules namely, antigens and antibodies.
- To study the clinical manifestations of immunological disorders.
- To appreciate the diversity of microbes and significance of certain microbes that are associated with man

Learning Outcomes:

- Imparts in depth knowledge of tissues, cells and molecules involved in host defense mechanisms Understanding of types of immunity
- Interactions of antigens, antibodies, complements and other immune components
- Understanding of immune mechanisms in disease control, vaccination, process of immune interactions
- Classification of microorganisms.
- Understanding of pathology of diseases caused by various microorganisms such as bacteria, virus, parasites and fungus

ELECTIVE PAPER-I

BIO-INFORMATICS, BIOSTATISTICS AND COMPUTER APPLICATIONS

Learning Objectives:

- To introduce the basics of bioinformatics biological databases, retrieval tools and applications.
- To understand data collection, data handling and data analysis.
- To understand computer components, certain MS Office applications, internet search engines and computer viruses.

Learning Outcomes:

- Basics of bioinformatics- biological databases, retrieval tools and applications.
- Collection, Handling, Analysis of biological data.
- Student's gains knowledge about statistical methods like measures of central tendencies.
- Computer applications in biological data / statistical methods

SBEC - IV

POULTRY SCIENCE

Learning Objectives:

- To explore the cultivation of poultry
- To understand the methodology of construction of poultry house
- To create the aware the students for about the poultry disease and its treatment
- To make the learner well aware of various methods in Poultry Science and its management.
- To train the students to undertake Poultry farming as income source.

Learning Outcomes:

- Students in Poultry Science study the nutrition, marketing, management and business skills needed in poultry production.
- Poultry Science students receive a foundation in basic sciences and mathematics, as well as un understanding of the poultry industry.

SBEC -V

MEDICAL LABORATORY TECHNIQUES (MLT)

Learning Objectives:

- To make the knowledge about medical laboratory instruments and its uses.
- To teach the method and collection of samples and its importance.
- To make aware the students during the emergency situation.
- To learn the blood sample collection and its cells counting.
- To learn the techniques used in the Clinical laboratory for sample analysis.
- To create knowledge on Self-Employment Opportunity.

Learning Outcomes:

- Understand fundamental analytical principles and processes used in clinical laboratory testing for various specimens.
- Understand the concepts and safety measures of clinical laboratory instruments.
- Acquired technical skills will help the students for collecting and processing biological specimens for analysis.
- Application of medical laboratory procedures will enable the students to distinguish normal and abnormal microscopic pathogens.
- Students enable their critical and analytical thinking in the detection of diseases.
- Interpretation will empower students to compare and contrast clinical laboratory procedures, interpret¬ data and predict diagnosis.

SEMESTER -VI

CORE COURSE -VIII

ENVIRONMENTAL BIOLOGY

Learning Objectives:

- To understand the basic ecological concepts.
- To learn the importance of environment and its related components.
- To attain the knowledge about the ecosystem and its characteristics.
- To develop an awareness of pollution and importance of environmental resources.
- To obtain the knowledge about the conservation of biodiversity

Learning Outcomes:

- Acquire the ecological knowledge and its biological significance.
- Understand the differences in the structure and function of ecosystems.
- Learn the ways of interactions of living and non-living organisms with the environment.
- Identify the problems of environment and analyzing its impact on biodiversity.
- The importance of hotspots, sanctuaries and their role in protecting biodiversity.

CORE COURSE –IX

ETHOLOGY

Learning Objectives:

- To understand why animals behave the way they do.
- To understand the cause of behavior.
- To understand how behavior develops.
- To explain both phylogenetically and physiologically the functional relationships of all factors involved in behavior.

Learning Outcomes:

- The range of behavior prevalent in the animal kingdom starting from innate to learned behavior, from fighting to cooperating etc.
- For effective management of game animals.
- Must be aware of habits of his / her animals to get maximum benefit.
- The cattle breeding, poultry, piggery, fishery, sericulture etc. have been developed as industries for the benefit of mankind, only after understanding the behavior of the respective animals.
- Man may want to keep pets for recreation.
- For healthy pet management it is essential to understand the behavior.
- The information and the insight gathered in animal behavior can be used to understand human behavior. Behavioral studies can help in animal conservation.
- By understanding the nesting and territorial habits of the birds can help to create or preserve the habitats required by them. It can also help to increase the number of endangered and threatened animals

CORE COURSE - X

EVOLUTIONARY BIOLOGY

Learning Objectives:

- On the completion of the course the student will be able to Identify the Origin of life.
- Relate the existing evidences of evolution with the process of evolution.
- Analyze critically the Evolutionary theories with examples.
- Understand the Patterns of Evolution
- Summarize the concept of species, mechanisms of speciation.
- Appreciate the evolution of man.
- Defend Animal distribution.

Learning Outcomes:

- After the completion of the course the student will be to
- Students are able to describe various biological interactions.
- Able to describe evolutionary history of man
- Able to describe origin of species on earth.
- Write competitive examinations like GATE / UPSC / TNPSC.
- Get an opportunity to work in the field of forensic science, Museum, Archeology.
- Do higher learning in the area of anthropology.

ELECTIVE COURSE – III

SERICULTURE

Learning Objectives:

- To know the history and socio-economical aspects of sericulture.
- To understand the classification and morphology of silkworm+.
- To obtain the knowledge about the description of Mulberry cultivation and pest management.
- To attain the knowledge about the disease management in sericulture.
- To understand the methodology followed for the reeling and rearing of sericulture

Learning Outcomes:

- Describe the economic impacts and income generation by sericulture.
- Educate the students about the basic biology of Mulberry culture.
- Expertise in the taxonomy, morphology and life cycle of the silkworm.
- Relate the strategies involved in the sericulture management system.
- Acquired the knowledge about the technologies in sericulture.

SBEC - VI

APICULTURE

Learning Objectives:

- Understand the basic life cycle of the honeybee. Learn about beekeeping tools and equipment.
- Learn to manage beehives for honey production and pollination.
- Learn about bee diseases and pests.

Learning Outcomes:

- Encourage Students‟ participation in scientific beekeeping.
- Maintain ecological balance in nature by way of domestication of honey bee species.
- Maintain small apiaries for demonstration, pollination, extraction and popularization of honey and other by-product of beekeeping.
- Motivation of students to adopt beekeeping as source of their livelihood.

CORE PRACTICAL – III

ANIMAL PHYSIOLOGY, DEVELOPMENTAL BIOLOGY, IMMUNOLOGY & MICROBIOLOGY, BIOINFORMATICS, BIOSTATISTICS AND COMPUTER APPLICATIONS, POULTRY SCIENCE&MLT.

Learning Objectives:

- To empower our students with practical skills to comprehend the Physiology and other functions of each and every vital systems.
- Identify experimental approaches in developmental biology.
- Recognise sources of error in experimental approaches in developmental biology.
- Analyse, compare, assess and evaluate experimental data in the field of developmental biology.
- To familiarize the student with principles of clinical microbiology,immunology, routine methods of identification of bacteria &study of common parasites of man
- To give the students a sound knowledge of pathogenic microbes, laboratory diagnosis, basic understanding of virology, mycology,& advanced serological techniques.
- Apply the knowledge to collect various Biological data and using statistical applications.
- Familiar with various Applications of Bioinformatics
- Understand practical knowledge on poultry science.
- Computer applications on biological data.•

Learning Outcomes:

- Students are able to do experiment on the role and functions of different systems.
- Able to describe the physiology of respiratory, renal, endocrine and reproductive systems to define normal and abnormal functions.
- Students are able to understand how physiological parameters are measured in mammals. Be able to list the types of characteristics that make an organism ideal for the study of developmental biology. Be familiar with the events that led up to fertilization.
- Be able to observe the first four rounds of cell division in different groups.
- Be able to identify the stages and cellular mechanisms for gastrulation.
- Demonstrate various types of Eggs Learn about various types of Placenta
- Develop skill in observing sperm motility
- Apply the computer knowledge to collect various Biological data
- Familiar with various Applications of Bioinformatics

- Get awareness about nature of the emerging digital knowledge society
- Students will gain skill to execute the roles of a biology teacher or medical lab technicians with training as they have basic fundamentals
- To impart awareness on Clinical Lab Technology
- To create knowledge on Self-Employment Opportunity by area of poultry science and MLT

CORE PRACTICAL – IV

ENVIRONMENTAL BIOLOGY, ETHOLOGY, EVOLUTIONARY BIOLOGY, SERICULTURE AND APICULTURE.

Learning Objectives:

- To inculcate the practical knowledge on moriculture and sericulture
- To know the importance of silkworm rearing, pests and diseases of silkworms and their control• measures To analyze the quality of silk through experiments
- To identify the honey bee species, races and castes
- To understand the behavior and physiology of honey bees
- To know the importance of honey bees and hive products
- To develop knowledge about value added products in honey

Learning Outcomes:

- Ability to Estimate of dissolved oxygen, Salinity, pH, free
- Carbonates and Bicarbonates, Calcium in water samples.
- Familiar with ecological adaptations
- Measure pH of different water samples using pH meter, pH paper and indicator solution.
- Demonstrate Alarm pheromones in ants.
- Identify the contributions of various evolutionists.
- Identify different zoogeographical realms with fauna.
- Apply knowledge on moriculture and sericulture
- Observe the biology, rearing, pests and diseases of silkworm and their control measures
- Evaluate the quality of silk
- Supply knowledge in identifying honey bee species, races and castes
- Field visit to study the apiary management techniques and honey harvesting methods
- Demonstrate the students for value added products in honey

B.Sc. ALLIED ZOOLOGY

ODD SEMESTER PAPER – I:

NON–CHORDATA AND CHORDATA

Learning Objectives:

- To appreciate the diversity of the animal kingdom.
- To understand characteristics of the non-chordate phyla and the chordate classes.
- To study the organization and life cycle of certain economically significant organisms.

Learning Outcomes:

- Get awareness on animal diversity
- Understand the affinities among the animals.
- Apply on zoology knowledge on further higher learning of other subjects.

PAPER – II:

GENERAL PRINCIPLES OF ZOOLOGY

Learning Objectives:

- Understand the structure of the cell and its functions Study the development of animals
- Analyse the physiology and functions of different organs
- Know environmental problems• Deploy the concepts of evolution

Learning Outcomes:

- Realisethe various cell structure, organelles,
- Gain Knowledge regarding genetic disorders, developmental process, physiological functions,
- Environmental aspects and evolutionary process.
- Applied knowledge for higher learning and occupational needs.

B.SC. ALLIED ZOOLOGY PRACTICALS

ODD & EVEN SEMESTER

NON – CHORDATA, CHORDATA AND GENERAL PRINCIPLES OF ZOOLOGY

Learning Objectives:

- To get anatomical knowledge and adaptations in animal group.
- To identify model animals as specimen / slides.
- To provide skill of drawing and labelling.
- To appreciate economic zoology for its importance.

Learning Outcomes:

- Getting fundamental knowledge on animal groups.
- Acquired skill of dissection, drawing and labelling.
- Awareness on economic value