

Govt. Shivalik College Naya Nangal

Department of Zoology

Course Outcomes

Theory Course Code I. Non-Chordates – SCIB1115T

2. Cell Biology- SCIB1114T

Class Bsc.1 (Medical) Session 2021-2022

S.No	Name of Paper	Course Outcome Bsc.1 (Medical) SEM -1
1.	Non-chordates	On completion of the course, students will be able to understand: 1. The evolutionary history of phylum. 2. The external as well as internal characters of non- chordates. 3. The distinguishing characters of non-chordates. 4. The economical importance of <i>Molluscs</i> , <i>Echinodermata</i> . 5. The life cycle and pathogenicity and control measures of <i>Fasciola hepatica</i> <i>Taenia solium</i> , <i>Ascaris lumbricoides</i> and <i>Wuchereria bancrofti</i> . 6. The evolutionary significance, affinities of <i>Peripatus</i> , <i>Balanglossus</i> .
2.	Cell Biology	On completion of the course, students will be able to : 1. Understand the central role of Cell biology being the rapidly developing areas of biological science. 2. Know about the Scope of cell biology, because cell is the basic unit of life. 3. Explain the Main distinguishing characters between plant cell and animal cell. 4. Understand the whole cell organelles with their structure and function. 5. Describe the cell cycle and know the importance of various cells in body of organisms. 6. Explain the various applications of cells by using cell biology. 7. Understand the Active and Passive transport system, diffusion and Facilitated transport inside the cell. 8. Know the cell processes and cell signalling.
Course Outcome Bsc.1 (Medical) SEM –II Theory Course Code 1. Chordates-SCIB1215T 2. Ecology-SCIB1214T		
1.	Chordates	On completion of the course, students will be able to: 1. Understand the diversity of among vertebrates and the relationship among the different group. 2. Classify vertebrates to their respective classes based on their concepts. 3. Develop the ability to follow the evolutionary pathway of vertebrates.

		<ol style="list-style-type: none"> 4. Inculcate the sense of scientific enquiry on biodiversity related topics. 5. Understand the role played by each organism in the construction and maintenance of ecosystem. 6. Acquire skills to identify an organism. 7. Understand the external morphology and sexual dimorphism in chordates. 8. Explain the various systems, adaptation and dentition in Mammals.
2.	Ecology	<p>On completion of the course, students will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate an understanding of ecological relationships between organisms and their environment. 2. Inculcate understanding of key concepts in evolutionary biology, the history of life on Earth, and phylogenetic relationships between organisms. 3. Create an understanding of structure/function relationships in organisms. 4. Demonstrate scientific quantitative skills, such as the ability to evaluate experimental design, read graphs, and understand and use information from scientific papers. 5. Develop skill in communication of their ideas in writing and in oral presentations. 6. Understand the population dynamics & regulation. 7. Acquire knowledge about wild life and its conservation strategies.

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Course Outcomes

Lab Course Code- Sem I - SCIB1116L

Sem II – SCIB1216L

Class Bsc.1 (Medical) Session 2021-2022

S.No	Name of Paper	Lab Course Outcome Bsc.1 (Medical) SEM -1
1.	Lab (Sem I)	On completion of the course, students will be able to: 1.Acquire knowledge on the scientific classification of invertebrate fauna 2. Familiarise with the diverse groups of organisms around us. 3. Create an aptitude for understanding nature and its rich biodiversity. 4. Familiarise the students about the protistan fauna living in and around us. 5.Understand the morphological characters of phylum Protozoa, Porifera, Annelida, Arthropod ,and Mollusca. 6.Know the ultrastructure of different cell organells. 7.Acquire knowledge on Barr bodies in sex determination.
Lab Course Outcome Bsc.1 (Medical) SEM -II		
2.	Lab (Sem II)	On completion of the course, students will be able to: 1.Acquire skills to identify an organism. 2. Understand the external morphology and sexual dimorphism in chordates. 3.Understand the development of advancing character in organism from lower chordates to higher chordates. 4.Acquire knowledge for identification of poisonous and non-poisonous snakes. 5.Understand the ecological habitat of various animals as well as their role in maintaining ecological balance in nature.

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Course Outcomes

Theory Course code 1. Biochemistry-SCIB2315

2. Animal Physiology-SCIB2316

Class Bsc.II (Medical) Session 2021-2022

S.No.	Name of paper	Course Outcome Bsc.II (Medical) Sem III
1.	Biochemistry	<p>On completion of the course, students will be able to:</p> <ol style="list-style-type: none">1. Describe about the agencies responsible for Production of various products using biochemistry.2. Understand the term pH, Buffer..3. Explain the structure and function of carbohydrate, amino acids, proteins, and lipids.4. Describe the concept Enzymes and also Vitamins and minerals.5. Understand the major role of Vitamins in metabolism and Deficiency disease.6. Acquire a broad understanding on the principles of Biochemistry illustrating the different types of food, their structure, function and metabolism.7. Learn the structure and functions of bio-molecules and their role in metabolism and will contribute to the critical societal goal of a scientifically literate citizen.
2.	Animal Physiology	<p>On completion of the course, students will be able to:</p> <ol style="list-style-type: none">1. Develop a deep knowledge in physiology and endocrinology.2. Demonstrate the experimental methods and designs that can be used for further study and research.3. Create awareness on the structure and functions of various systems in the human body, their functioning and related disorders.4. Understand the hormonal regulation of various systems of the body and the role played by various hormones in regulating the homeostasis.5. Understand the physiology of digestion in alimentary canal.6. Acquire knowledge the mechanism of respiration, circulation and urine formation in mammals.7. Understand the various abnormality occur due to Endocrine glands.

Course Outcome Bsc.II (Medical) Sem IV
 Course code 1. Evolutionary Biology- SCIB2415
 2. Genetics- SCIB2416

1.	Evolutionary Biology	<p>On completion of the course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the Origin and development of animals. 2. Develop awareness on the process of evolution. 3. Acquire knowledge about the evolutionary history of earth (living and non- living) and Evidences of evolution. 4. Learn various theories of evolution of life. 5. Clear the concepts of Universe, theories of life cycles. 6. Understand the Lamarkism, Neo-Lamarkism and Darwinism. 7. Understand the Geological time scale. 8. Acquired awareness on the concept of Palaentology ie. Fossils and its significance. 9. Understand the relationship between evolution and population genetics.
2.	Genetics	<p>On completion of the course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the mode of inheritance and the process of interaction of genes. 2. Aware about the basics of genetics and classical genetics covering prokaryotic and higher eukaryotic domains. 3. Understand the central role that genetics and biotechnology plays in the life of all organism. 4. Describe the mechanism of sex determination, linkage groups and linkage map, crossing over and non- disjunction of genes in animals. 5. Understand the Mendelian genetics across these life-forms, students will be exposed to concepts of population genetics. 6. Exposed to quantitative genetics encompassing complex traits, clinical genetics and genetics of evolution. 7. Understand the various genetic abnormality occur due to recessive and dominant sex linked inheritance. 8. Learn the extra nuclear inheritance, bacterial and human genetic.

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Course Outcomes

Lab Course Code Sem III – SCIB2317

Sem IV- SCIB2417

Class Bsc.II (Medical) Session 2021-2022

S.No	Name of Paper	Lab Course Outcome Bsc.II (Medical) SEM –III
1.	Lab (Sem III)	On completion of the course, students will be able to: <ol style="list-style-type: none">1. Understand the estimation of haemoglobin (Hb) content.2. Will be able to estimate the blood pressure.3. Develop knowledge for the estimation of blood group.4. Understand the mechanism of electrocardiogram (ECG).5. Acquire knowledge about coagulation & bleeding time.6. Able to do analysis of urine for urea and glucose.
Lab Course Outcome Bsc.II (Medical) SEM –IV		
2.	Lab (Sem IV)	On completion of the course, students will be able to: <ol style="list-style-type: none">1. Understand the process of evolution and learn various tools and techniques for evolutionary studies.2. Acquire knowledge on fossils record of various animals.3. Gain knowledge on evolutionary history of Man which inculcate interest in research.4. Analyze the Karyotype and must differentiate between normal and abnormal chromosome pattern.5. Understand the mechanism of Dermatographics and its relation to genetic disorders.6. Describe the inheritance of ABO Blood group in man.

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Course Outcomes

Theory Course code 1. Molecular Biology- SCIB3514

2. Developmental Biology- SCIB3515

Class Bsc.III (Medical) Session 2021-2022

S.No.	Name of paper	Course Outcome Bsc.III (Medical) Sem V
1.	Molecular Biology	<p>On completion of the course, students will be able to:</p> <ol style="list-style-type: none">1. Develop understanding on the cell biology and molecular biology.2. Know the various cell types and cell divisions.3. Understand the structure and function of the cells.4. Provide a basic understanding on the term cell signalling.5. Analyse the fundamental processes of the cell (DNA Replication, transcription translations)6. Acquire knowledge on the Tools and Techniques: recombinant DNA technology, quantitative estimation/Isolation of DNA by using spectrophotometer.7. Understand the ELISA technique and DNA finger printing.8. Understand genetic, molecular and cellular techniques, including genome editing, used to investigate developmental and cell biology processes in various organisms.9. Demonstrate observational and technical skills to collect and analyse quantitative data, record observations, interpret findings and present experimental data
2.	Developmental Biology	<p>On completion of the course, students will be able to:</p> <ol style="list-style-type: none">1. Understand the basic developmental processes that lead to the establishment of the body plan of vertebrates.2. Provide a basic understanding of the experimental methods and designs that can be used for further study and research.3. Learn the pathology related to mechanisms of development and differentiation.4. Benefit students in their further studies in the biological/physiological sciences and health-related fields5. Contribute to the critical societal goal of a scientifically literate citizenry.6. Acquire knowledge on birth defects and causes and reduce the risk by educating society.7. Describe the morphological processes that transform a fertilised egg into a multicellular organism.

		<p>8. Identify model organisms used to investigate developmental biology and compare the developmental programmes of different organisms.</p> <p>9. Work effectively in diverse groups to investigate and communicate concepts in cell and developmental biology</p>
<p>Course Outcome Bsc.III (Medical) Sem VI Course Code 1. Medical zoology and Medical Laboratory Technology- SCIB3614 2. Immunology- SCIB3615</p>		
1.	Medical zoology and Medical Laboratory Technology	<p>On completion of the course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the physical, mental and social health and also know the safer disposal of various wastes. 2. Gain the knowledge about the preventive measure. 3. Acquiring knowledge on epidemic and endemic diseases. 4. Gain the knowledge about the maintenance of hygienic conditions, various diseases and their preventive measure. 5. Know the methods of various instrumentations related to biological systems. 6. Gain knowledge about the establishment of clinical laboratory and also useful for research purpose.
2.	Immunology	<p>On completion of the course, students will be able to:</p> <ol style="list-style-type: none"> 1. Develop the basic knowledge of immunological processes at a cellular and molecular level. 2. Inculcate knowledge on the central immunological principles and concepts outline, compare and contrast the key mechanisms and cellular players of innate and adaptive immunity and how they relate elucidate the genetic basis for immunological diversity and the generation of adaptive immune responses. 3. Understand the key events and cellular players in antigen presentation, and how the nature of the antigen will shape resulting effector responses. 4. Identify the main mechanisms of inflammation. 5. Understand and explain the basis of allergy and allergic diseases. 6. Explain the role of immune system in cancer; tumor immunology and principles of immune-therapy.

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Course Outcomes

Lab Course Code Sem V- SCIB3516

Sem VI- SCIB3616

Class Bsc.III (Medical) Session 2021-2022

S.No	Name of Paper	Lab Course Outcome Bsc.III (Medical) SEM –V
1.	Lab (Sem V)	On completion of the course, students will be able to <ol style="list-style-type: none">1.Describe the development of Frog and Chick.2.Understand the various stages of gametogenesis.3.Acquire knowledge on various type of placenta.4.Quantitative estimation of DNA by using spectrophotometer.5.Separation of DNA by electrophoresis.6.Solve numerical problems on Genetic Code .
Lab Course Outcome Bsc.III (Medical) SEM –VI		
2.	Lab (Sem VI)	On completion of the course, students will be able to: <ol style="list-style-type: none">1.Gain knowledge about the establishment of clinical laboratory and also useful for research purpose.2.Estimate haemoglobin count.3.Counting of WBC, RBC&DLC.4.Analysis of blood group A, B, AB, O and Rh.5.Acquire knowledge on estimation of ESR, bleeding time, and coagulation time.6.Provide a basic understanding on the autoimmune disease.7.Use various lab apparatus like autoclave, centrifuge and spectrophotometer during future research work.

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Department of zoology
Theory Program Outcome
Course Code- SCIB03PUP
Class Bsc. (Medical)
Session 2021-2022

At the end of the program in Zoology the students will able to:

1. Develop deeper understanding of key concepts of zoology at molecular, cellular level, physiology and reproduction at organism level.
2. Describe the role of taxonomy and systematics in animal studies and gain in-depth knowledge of animals including invertebrates and vertebrates..
3. Place zoological knowledge in context and show an understanding of the way zoologists think and understand the needs of zoology in shaping our planet.
4. Comprehend, interpret, general evolutionary relationships among and between different animal groups.
5. Correlate between the various animal habitats, their behavior and during the course of evolution
6. Learn the skills of handling various scientific equipment, designing and performing the laboratory experiments.
7. Explore applied fields with the knowledge of Medical Zoology & Laboratory techniques.
8. Communicate the importance of ecological factors, biodiversity, environmental conservation processes, pollution control and protection of threatened species to the society
9. Enhance their scientific temper and scientific thinking and exhibit creativity in designing, planning, problem solving, model making for various scientific concepts

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Department of Zoology

Lab Program Outcome

Course Code- SCIB03PUP

At the end of the program in Zoology the students will able:

- 1.To know the scope and importance of Zoology.
- 2.To develop scientific temper among students.
3. To inculcate interest in nature and living forms and their conservation.
- 4.To make the students eco-friendly by creating a sense of environmental awareness in them.
- 5.To give better exposure to the diversity of life forms.
- 6.To study different ecological sites for animals in their natural habitats by field study.
- 7.To provide opportunities for the application of the acquired knowledge in day- to - day life.
- 8.To develop skills in doing experiments, familiarizing equipments and biological specimens.
9. To undertake scientific projects which help to develop research aptitude in students.
10. To attain interdisciplinary approach to understand the application of the subject in daily life.
11. To knowing the rules of taxonomy and the principle of animal classification.
12. To understood the diversity morphology, biological characters and taxonomical importance some selected museum specimens of different animal groups.
13. To attained knowledge of qualitative analysis of macromolecules, excretory products, blood glucose and cholesterol.
14. Skill development for the observation of blood cells and haemin crystals.
15. To understood the working principle and applications of physiological instruments.
- 16.To attained knowledge on the observation of preserved specimens and instruments of blood related experiments.