DEPARTMENT OF ZOOLOGY
Synod College, Shillong

COURSE OUTCOMES

Paper-1 A (Theory)

Systematics, Animal Diversity and Evolution

Course Outcomes (COs) for Theory

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

1. Understand the importance of systematics, taxonomy and structural organization of animals.

2. Appreciate the diversity of non-chordates and chordates living in varied habit and habitats.

3. Be in a position to critically analyse the organization, complexity and characteristic features of non-chordates and chordates familiarizing them with the morphology and anatomy of representatives of various animal phyla.

4. Enhancement of collaborative learning and communication skills through practical sessions, team work, group discussions, assignments and projects.

Paper 1B (Practical)

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

1. Learn the skills for dissection of anatomical systems in an invertebrate and a vertebrate.

2. Identify the major structures of the nervous and reproductive systems in cockroach, the digestive system in fish.

3. Learn the skill of permanent mounting of biological specimens. They will be able to explain the purpose and importance of preparing permanent mounts in biological research, and how this technique is used to study the structures and functions of organisms.

4. Describe the materials and equipment needed for preparing permanent mounts.

5. Identify some anatomical structures of invertebrates and vertebrates, and their roles in the organisms' biology.

6. Identify animals and to describe the identifying characters. They will also be able to classify the animals following the taxonomic hierarchy

Paper-2 A (Theory)

Cell Biology and Genetics

Course Outcomes (COs) for Theory

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

1. Understanding the structures of the cell and its organelles.
2. Understand the chromosomes and their structures and functions
3. Understand the cell cycle, the cell division and the immune system.
4. Have knowledge on the principle of inheritance, multiple alleles and gene interactions; sex determination; linkage and crossing over; chromosomal aberrations.

Paper-2 A (Practical)

Cell Biology and Genetics

Course Outcomes (COs) for Practical

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

1. Learn the structures of cell organelles.
2. Learn the hands on experiment on mitosis and meiosis.
3. Identify chromosome types
4. Learn multiple alleles of ABO blood group and phenotypic variations.

Paper-3 A (Theory)

Animal Physiology, Endocrinology and Biochemistry

Course Outcomes (COs) for Theory

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

1. Understanding the process of digestion and absorption of protein, carbohydrate and lipid. Types of vitamins. Respiration in vertebrates.

Structure and types, of hearts in vertebrates and the composition of blood.
2. Learn the structures and functions kidney and nephron. Skeletal muscles and its mechanism of contraction. Ultrastructure of neuron and synaptic transmission.
3. Gain knowledge on the structures and functions of endocrine glands in vertebrates and in insects.
4. Understand the classification and significance of macromolecules, TCA cycle, Beta Oxidation.
5. Learn the structure, function and property of enzyme. Structure and function of Nucleic acids and their significance.

Paper-3 B (Practical)

Animal Physiology, Endocrinology and Biochemistry

Course Outcomes (COs) for Practical

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

1. Learn the experiment on haemin crystal, blood clotting time from human blood; oxygen consumption; permanent slides of endocrine glands; detection of carbohydrates, proteins and lipids and Ascorbic estimation.

Paper-4 A (Theory)

Developmental Biology, Ecology and Economic Zoology

Course Outcomes (COs) for Theory

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

1. Understand the developmental stages of embryo till the formation of organism in vertebrates.
2. Learn the ecological organizations, structure, trophic structure and trophic relationship.
3. Understand the population growth and regulation, biotic community, and environmental pollution.
4. Learn about Pisciculture, sericulture, apiculture; integrated pest management.

Paper-4 A (Practical)

Developmental Biology, Ecology and Economic Zoology

Course Outcomes (COs) for Practical

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

1. Learn the experiments on eggs and stages of development of vertebrates; study of larval forms of invertebrates.
2. Understand and learn the estimation of ecological samples for oxygen, alkalinity, carbon dioxide.
3. To identify planktons; life cycle of silk moth; honey bees and Indian major carps.

Paper-5 A (Theory)

Functional Anatomy, Zoogeography and Adaptation

Course Outcomes (COs) for Theory

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

1. Gain knowledge about the variations in the morphology, physiology and anatomy of the different groups of invertebrates and vertebrates.
2. Learn the affinities and metamorphosis of protochordates.
3. Understand the significance of study of amphibian, reptilian, aves and mammals.
4. Learn about zoogeography, behavior and adaptations.

Paper-5B (Practical)

Functional Anatomy, Zoogeography and Adaptation

Course Outcomes (COs) for Practical

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

1. Learn hands on dissecting of the nervous system of prawn, accessories organs is fishes, digestive and reproductive systems in fishes.
2. Learn to prepare and mount permanent slides and to learn the histological tissues from prepared slides.

Paper-6 A (Theory)

Cell and Molecular Biology and Genetics

Course Outcomes (COs) for Theory

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

1. Understanding the genomic organization in lower and higher organisms.
2. Learn the central dogma of molecular biology, DNA replication, Transcription, translation in prokaryotes, genetic code and regulation of gene expression.
3. Learn the fine structures of the gene, transposons, gene mutation, DNA damage and repair.
4. Understand extra nuclear inheritance, sex-linked inheritance, dosage compensation, non-disjunction, human karyotypes.
5. Understand the humoral and cell mediated immunity, antigens and antibodies, and major histocompatibility complex.
6. Learn the different reliable biological techniques.

Paper-6 B (Practical)

Cell and Molecular Biology and Genetics

Course Outcomes (COs) for Practical

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

1. Learn how to separate the amino acids from the biological solution.
2. Learn the antigen-antibody interaction,
3. Learn the estimation of DNA and RNA, electrophoretic separation of DNA/protein.
4. Learn the identification of meiotic stages.
5. Learn the normal and abnormal human karyotyping.

Paper-7 A (Theory)

Biochemistry, Animal Physiology and Endocrinology

Course Outcomes (COs) for Theory

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

1. Learn about physical solutions like acids, bases, pH, and buffers, diffusion and osmotic pressure and enzyme kinetics.
2. Understand the structure of carbohydrates, proteins and their functions, formation and break down of glucose. The formation of ATP via Electron transport chain and oxidative phosphorylation and urea cycle.
3. Understand the concepts of physiology of animals like Haemoglobin content, blood clotting, cardiac cycle, Blood pressure, gaseous exchange and osmoregulation.
4. Know and learn about hormones their structures and function, biosynthesis and mechanism of action. The reproductive cycles in mammals, the hormonal regulation in the egg and sperm formation and pregnancy.

Paper-7 B (Practical)
Biochemistry, Animal Physiology and Endocrinology

Course Outcomes (COs) for Practical

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

1. Learn the counting of WBC, RBC.
2. Learn the estimation of Haemoglobin in human blood, glucose, protein by calorimetric method.
3. Learn the dissection of endocrine glands and microtomy.

Paper-8 A (Theory)

Developmental Biology, Environmental Biology and Biotechnology

Course Outcomes (COs) for Theory

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

1. Learn the pattern of cleavage, morphogenetic movements, embryonic induction and organizer and gastrulation in chicks.

2. Learn and understand the foetal membranes and placenta, organogenesis of the vertebrate eye, regeneration, teratogenesis and aging.
3. Understand the ecosystem and its laws, biogeochemical cycles, ecological succession and biomes.
4. Learn the environmental concerns, radioactive pollution, biomagnification, anthropogenic activities, ozone depletion, greenhouse effect, global warming and acid rains.
5. Understand the Conservation of wildlife.
6. Learn about cloning and its procedures and the methods of DNA separation and multiplication with their applications, ethical issues and biosafety regulations.

Paper-8 B (Practical)

Developmental Biology, Environmental Biology and Biotechnology

Course Outcomes (COs) for Practical

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

1. Learn on permanent preparation of chick embryo.
2. Learn and understand regeneration, community analysis from different samples and study of plankton.
3. Learn the analysis of community similarities and species diversity.
4. Learn the estimation of total hardness of water samples.
5. Undertake field study/trip and to learn writing the field report.