

PhD. course work Syllabus

Subject: Zoology

(Term Paper/Project work)

Course-6 (PHD-Zool-5062)

Credit-2

Unit I: Statistical analysis and data representation: SD, SE, Co-relation and Regression, Test of Significance, ANOVA, DMRT, data validation, biological significance of data.

Unit II: Sampling size in data analysis, utility of computer/software (MS office, excel, power point, graphics, sigma plot, SPSS etc.) in data analysis and presentation.

PhD. course work Syllabus
Subject: Zoology (Optional Course)
Animal Physiology and Biochemistry
Code: PHD-Zool-5054
Credit-4

Unit I: Cellular and Molecular Physiology: Cell to cell communication and cell signaling, checkpoints and regulation of cell cycle. Molecular basis of hormonal signaling hormone assay. Cellular and molecular interaction during induction of immune response, protein sequencing, proteomics, enzyme kinetics, clinical enzymology, diagnostic and therapeutic uses of enzyme.

Unit II: Homeostasis, Cardiovascular and Respiratory Physiology: Blood vascular resistance, turbulence, blood pressure, role of platelets in blood homeostasis. Heart sound in cardiac cycle, cardiorespiratory and vasomotor centers, reflex regulation of heart and respiratory system. Mechanics of breathing, compliance, gas exchange, artificial respiration. Respiratory distress syndrome- sudden infant death.

Unit III: Nervous system, Biorhythm, Excretion: Modern techniques for studying nervous mechanisms including neuroimaging, neural migration. Neurological disorders of brain - general cellular events. Mechanism of development of degenerative diseases- Alzheimer's, Parkinson's Disease. ALS etc. Biorhythm generation and regulation disorders of biological clock perception of vision, audition and olfaction, Structure and functional relationship of nephron, renal regulation of sodium ion exchange.

Unit IV: Metabolism of Carbohydrates, protein and lipids: Carbohydrates and its physiological importance, structure and food storage of polysaccharides. Biological significance of carbohydrates, proteins and lipid. Essential and non-essential amino acids, importance of lipids and steroids. Glycogenesis, glycogenolysis and glycolysis. Amino acid degradation deamination, glucogenic and ketogenic amino acid.

Unit V: Cell respiration and Biological Oxidation: Nutrient oxidation, oxidation vs reduction, biological oxidation, oxidative phosphorylation, hydrogen and energy transfer, aerobic and anaerobic hydrogen transfer. Significance of ADP and ATP high energy cycle.

PhD. course work Syllabus
Subject: Zoology (Core- Course)
Faunal Diversity and Bioenterpreneurships of Assam
Code: PHD-Zool-5044
Credit-4

Unit I: Biodiversity – its meaning and scope. Hotspots of biodiversity and gene pool. Different types of reserve forests, National parks and their conservation, wild life protection strategies and action plan.

Unit II: Biodiversity and its conservation: Organic evolution and distribution in space and time. Climate and its impact on biodiversity. Endangered and Endemic species, Threatened species of animals of North east India. Strategies for conservation. National forests policy, Biodiversity Act, Wild life Protection act of India.

Unit III: Deforestation and loss of biodiversity: meaning and scope, global trend of deforestation, effects of deforestation and hydrologic regime and climate. Soil quality and erosion. Loss of habitat and loss of biodiversity. Shifting cultivation visa-vis loss of biodiversity.

Unit IV: Grassland and its types, special reference on North east India. Tropical savannas and wet grasslands. Wet lands of Assam which are in the form of chapories, swamps, lakes, marshes and beels. Ramsar convention, reference on Ramsar site of Assam.

Unit V: Bioenterpreneurship – its meaning and scope. Permissions and acts associated with the use of animal products and parts of organ in market. Vendors, selling wild bio-resources in local markets, communities involved in the local treads, collection and sellers for new marketing opportunities.

Recommended Books:

1. Faunal Diversity of Biogeographic Zone of India: Gangetic Plains; Kaliash Chandra, Dhriti Banerjee
2. Faunal Diversity of Rajasthan by Dr. Satish Kumar Sharma
3. Faunal Diversity and Recent trends in Animal Taxonomy by Ambalaparambil Sudhikumar.
4. Faunal Diversity in India by R.C. Sobti
5. Biotechnology Enterpreneurship: leading, Managing and Commercializing Innovative Technologies by Cralg Shimasaki
6. Handbook of Bioenterpreneurship edited by Thomas Brenner and Holger Patzelt.

Programme specific Objective:

- Document the plant and microbial resources of Assam and their application.
- Analyse the issues of environmental contexts and sustainable development.
- Standardize protocol for analyzing and assessment of biodiversity of NER India and their application