ZMPhil Syllabus
Rajiv Gandhi Central University, Itanagar
Arunachal Pradesh
SEMESTER-I

PAPER CODE: ZMPHIL 801 **TOTAL MARKS: 100**

RESEARCH METHODOLOGY **EXAMINATION MARKS: 75**

INTERNAL ASSESSMENT MARKS: 25

1. Review of literature and bibliographic writing, research design, experimental setup, hypothesis testing **(AT)**; Statistical validation of experimental data (t-test, ANOVA, correlation and regression analysis: manual and advance software application), scientific presentation. **(DND)**
2. FISH (Fluorescence In-Situ Hybridization) and Immuno - Histochemistry, Application in biological research. **(PK)**
3. Genome isolation and PCR techniques. **(DM);** PCR application in quantitative and qualitative gene expression in eukaryotes. **(JC)**
4. Transgenesis, Site directed mutagenesis and Knock-out animals: Method and applications in the study of gene expression. **(HG)**
5. Genetic toxicity assessment in Zoological research: (micronuclei, chromosome aberration, Sister-chromatid Exchange assay and Comet assay). **(MKB)**

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FUNDAMENTAL OF ZOOLOGY **EXAMINATION MARKS: 75**

INTERNAL ASSESSMENT MARKS: 25

1. Molecular taxonomy; Numerical taxonomy. **(AT);** Diversity assessment and different indices. **(DND)**
2. Natural selection and its role in population; Nucleotide polymorphism and its evolutionary significance. **(HG)**
3. Homeostasis and bioenergetics in vertebrates: osmoregulation, respiration and circulation. **(PK)**
4. Coordination in animals; development and functional diversification of neuroendrocrine systems in **vertebrates. (HNS);** Coordination in animals; development and functional diversification of neuroendrocrine systems in **invertebrates. (MKB)**
5. Wild life and its status in India; Wild life management and techniques of EIA. **(DM)**

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SEM-I

PAPER CODE: ZMPHIL 802

FUNDAMENTALS OF ZOOLOGY

TOTAL MARKS: 100

Examination marks: 75

Internal Assessment marks: 25

1. Molecular taxonomy; Numerical taxonomy. Diversity assessment and different indices.
2. Natural selection and its role in population; Nucleotide polymorphism and its evolutionary significance.
3. Homeostasis and bioenergetics in vertebrates: osmoregulation, respiration and circulation
4. Coordination in animals: development and functional diversification o neuroendocrine system in vertebrate and invertebrates.
5. Wild life and its status in India; Wild life management and techniques of EIA.

SEMESTER - II

PAPER CODE: ZMPHIL 803 **TOTAL MARKS: 100**

ADVANCE ZOOLOGY **Examination marks: 75**

Internal Assessment marks: 25

1. Animal cell culture and cell line. Stem cell and applications. Gene and animal cloning
2. Development of Biotechnology approach for aquaculture, apiculture and sericulture.
3. Modern technique in animal production and genetic improvement: Gamete preservation, gamete culture & in vitro fertilization.
4. DNA Micro array technology. DNA finger printing and its applications.
5. Environmental toxicology: Industrial and food borne toxicants. Approach of bioremediation of environmental toxicants.

OPTIONAL 2: WILDLIFE AND CONSERVATION BIOLOGY

PAPER CODE: ZMPHIL 805 **TOTAL MARKS: 100**

WILDLIFE AND CONSERVATION BIOLOGY **Examination marks: 75**

Internal Assessment marks: 25

1. Wildlife of India, brief biology of endangered species of mammal, bird, amphibian and reptile of Arunachal Pradesh.
2. Survey and Census technique in wildlife fauna
3. In situ and ex situ conservation technique
4. characteristic of eastern Himalayan biodiversity hotspot, threat to biodiversity, Protected areas network in Arunachal Pradesh
5. IUCN conservation categories, international ,national and state conservation act/policies and bodies

OPTIONAL PAPERS

OPTIONAL 1: FOOD AND NUTRIOTIONAL BIOLOGY

PAPER CODE: ZMPHIL 804 **TOTAL MARKS: 100**

Examination marks: 75

Internal Assessment marks: 25

1. Basic food groups, Fuel value of Carbohydrates, Fats and protein, Physical and biological effect of antioxidant
2. Balanced Diet: - Concept and significances, nutritional requirement and feed formulation
3. Types of therapeutic diet. • Representative diets in various ailments – (diabetes mellitus, cardio vascular diseases, kidney, anemia)
4. Nutritional significances of proteins, requirements of vitamins, Sources of fat and oil function utilization, Acid – base balance in body fluids.
5. Methods of nutritional analysis- amino acids, phytosteroids and micronutrients

OPTIONAL 3: ENTOMOLOGY

PAPER CODE: ZMPHIL 806

TOTAL MARKS: 100

Examination marks: 75

Internal Assessment marks: 25

1. Origin and evolution of terrestrial arthropods with special reference to insects and application of cladistic analysis. Systematics of class insecta and application of molecular and numerical taxonomy.
2. Comparative anatomy and physiology of reproductive and endocrine system. Metamorphosis and its hormonal regulation.
3. Laboratory and field methods: collection, culture, preservation, documentation and museum maintenance.
4. Applied entomology: Insecticides and mode of action. Concept of IPM, biological control and crop management.
5. Forensic entomology: techniques and inferences.