

Ph D COURSE WORK SYLLABUS



w.e.f.: February, 2026

B. Borooah College (Autonomous)
Guwahati, 781007
Assam, India

Ph. D course work Syllabus for Botany and Zoology

1st semester

Papers	Credit	Written Exam	Internal assessment	Total marks
1. Research and Publication Ethics (Swayam)	4	60	15	75
2. Research Methodology and IPR (Swayam)	3	40	10	50
3. Academic Writing (Swayam)	4	60	15	75
4. Environmental issues	6	80	20	100
5. Applied Zoology/Applied Botany	6	80	20	100
Total	23	320	80	400

2nd semester

Papers	Credit	Written Exam	Internal assessment	Total marks
1. Modern research techniques and instrumentation	6	80	20	100
2. Review of literature, report and seminar	6	Review report 80	Presentation 20	100
3. Preparation and presentation of research plan proposal	6	Proposal writing 80	Presentation 20	100
Total	18	240	60	300

Paper 3 will be specific proposal finalized in consultation with the respective supervisor. The student will write a proposal and defend it by power point presentation.

Paper: ENVIRONMENTAL ISSUES

TOTAL MARKS: 80 + 20 = 100

CREDITS: 6

Present environmental issues – national and international. Environmental education, international concern of Environment and Environmental education, Socio -economic aspects of environmental problems, Importance of environmental education in solving environmental problem.

Assessment and monitoring of biodiversity; Indicators for biodiversity; methodology of assessment and analysis of different species groups, monitoring of different species groups; importance of documentation and use of information technology in biodiversity study

Conservation strategies; conservation genetics; wildlife biology; ex -situ conservation: facilities, establishment of new populations, captive breeding, reintroduction, discussion on advantages and disadvantages; *in-situ* conservation: assessment of adequate areas, design and management of protected areas; problems of protected areas in India, connectivity and corridors; population biology of endangered species

Impact of climate change on natural and managed ecosystems, natural: forest, freshwater and marine aquatic systems, managed systems: agriculture, urban infrastructure, society; future climate projections; sea level rises and its impacts on natural systems (physical and biological) and society; Sectoral and regional climate impacts: case studies on infrastructure, agriculture and food system, water intensive industries, health, urban heat island

Intellectual Property Right: Terminology associated with IPR, Patent, Copyright, Trademarks, design, geographical indication, plant varieties and farmers right protection, trade services, biopiracy, traditional knowledge.

Paper-Zool-PhD
Applied Zoology
TOTAL MARKS: 80 + 20 = 10
CREDITS: 6

Model systems and model organisms: Prerequisite of a model system, in vitro systems, Prokaryotic model organism, Eukaryotic model organism: *Drosophila*, *Hymenolepis*, Zebra fish and mouse

Experimentation on Animals: Animal handling and animal ethics, Maintenance of animals, Various routes of injection and sample collection, CPCSEA guidelines for experimentation

Methods in field biology: Methods of estimating population density of Animals and plants, ranging patterns through direct, indirect and remote observations, sampling methods in the study of behavior, habitat characterization-ground and remote sensing methods.

Bioinformatics: Introduction to databases: types and kinds of databases, applications and limitations. Literature search databases, motifs and pattern databases, databases for specific identification and classification, structural databases. Web tools and resources for sequence analysis: pair wise and multiple sequence alignment, sequence similarity search: BLAST, pattern recognition, motifs and family prediction restriction map analysis, primer design, phylogenetic tree, protein structure prediction and visualization.