BHAGWANT UNIVERSITY
Sikar Road, Ajmer
Rajasthan

Syllabus

Institute of Life Sciences & Applied Sciences
M. Phil
(Zoology)

ANNUAL SCHEME OF EXAMINATION:

1. Every candidate shall be required to offer three written papers and one dissertation (equivalent to one paper). Within this frame work the Board of Studies shall recommend the course of study for the M. Phil examination.
2. The course of study for the M. Phil degree shall extend over a period of one academic year. There shall be a continuous internal assessment and as external assessment. The proportion of internal and external assessment shall be 30:70. There will be no internal assessment in the dissertation. Total marks for M. Phil will be 400. Dissertation may be written by the candidates under the supervision of any teacher who is registered as M. Phil Supervisor. Supervisor can guide normally five dissertations. However, the maximum limit may be relaxed by the permission of Vice-Chancellor on the recommendation of Head. The internal Supervisor can guide five candidates and workload of six hours is admissible for each M. Phil course for dissertation. The Supervisor will sign and issue a certificate counter signed by the Head of department concerned.
3. The internal assessment may be evaluated on the basis of:

   (a) Mid Terms : 15 Marks

   (b) Assignments /Seminar Presentation /Group Discussion: 15 Marks

4. Each theory paper shall consist of 100 marks. The dissertation shall also consist of 100 marks. For a pass, a candidate shall be required to obtain (a) at least 40% marks in each paper separately (b) a minimum of 50% marks in the aggregate of all the papers prescribed for the examination. In the mark sheet, successful candidates shall be classified as under

   First Division 65% or more.

   Second Division 50-65%

6- A candidate will have to pass individually both in the Internal as well as external examination and it should be shown separately in the marks sheet.

7- The placement of every candidate under a Supervisor/Guide shall be decided within two months from the last date for admission.

8- A candidate who fails at the examination even in one paper/dissertation shall be required to reappear at the examination in a subsequent year in all the papers/dissertation prescribed for the examination, provided that a candidate who obtains at least 50% marks

in dissertation shall be exempted from the submitting a fresh dissertation and the marks obtained by him shall be carried forward for working out his result.

9- For each theory paper 10 questions will be set for the final examination and the candidate will have to attempt at least five questions. All the questions will carry equal marks.

10- Workload distribution: There will be a teaching of four periods of one hour duration per week for each theory paper and six hours for dissertation.

i.e. 4X3 = 12 hours for theory papers and six hours for dissertation per week.

Paper Code	Papers Name	TEACHING PERIOD			External Marks	Internal		G. Total
		L	T	P		Mid Terms 15 marks	Assignments /Seminar Presentation / Group Discussion	
01MPL24101	**Research Methodology Theory And Techniques**	4	-	-	70	15	15	100
01MPL24102	**Environmental Biology**	4	-	-	70	15	15	100
01MPL24103	**Environmental Pollution And Eco-Toxicology**	4	-	-	70	15	15	100
01MPL24201	DISSERTATION	-		2	100	-	-	100
Total		12	-	2	310	45	45	400

Research Methodology Theory And Techniques

Course/Paper: 01MPL24101

Year-I

UNIT - I

Research – Definition – Importance and Meaning of research – Characteristics of research – Types of Research – Steps in research – Identification, Selection and formulation of research problem – Research questions – Research design – Formulation of Hypothesis – Review of Literature.

UNIT – II

Sampling techniques : Sampling theory – types of sampling – Steps in sampling – Sampling and Non-sampling error – Sample size – Advantages and limitations of sampling. Collection of Data : Primary Data – Meaning – Data Collection methods – Secondary data – Meaning – Relevances, limitations and cautions.

UNIT – III

Statistics in Research – Measure of Central tendency – Dispersion – Skewness and Kurtosis in research. Hypothesis – Fundamentals of Hypothesis testing – Standard Error – Point and Interval estimates – Important Non-Parametric tests : Sign, Run, Kruskal – Wallis tests and Mann-Whitney test.

UNIT – IV

Para metric tests : Testing of significance – mean, Proportion, Variance and Correlation – testing for Significance of difference between means, proportions, variances and correlation co-efficient. Chi-square tests – ANOVA – One-way and Two-way.

UNIT – V

Research Report : Types of reports – contents – styles of reporting – Steps in drafting reports – Editing the final draft – Evaluating the final draft.

Reference Books

1. Statistical Methods - S.P. Gupta
2. Research Methodology Methods and Techniques - C.R. Kothari
3. Statistics (Theory and Practice) - B.N. Gupta
4. Research Methodology Methods and Statistical Techniques - Santosh Gupta

Environmental Biology

Course/Paper: 01MPL24102

Year-I

UNIT – I

Environmental Biology – Introduction, Biotic and A biotic factors of environment – Relationship among organisms, Animal Biodiversity.

UNIT – II

Ecosystem – Components, characteristics, Energy flow in ecosystem – Tropic levels. Chain, food web – Ecological Pyramids – Man and Biosphere – Environmental education.

UNIT – III

Population ecology – Population characteristics – Population control – Community – Characteristics, components.

UNIT – IV

Environmental pollution – In fresh water ecosystem – sources, assessment of pollution (BOD, COD) – In marine ecosystem – Sources, impart of pollution in fisheries – In terrestrial environment – Solid wastes and non-degradable wastes.

UNIT – V

Management of pollution – Sewage treatment, industrial effluent treatment, solid waste, liquid wastes, organic recycling, Biogas production, fish culture, algae production, Bio-compost. Restoration habitat – remote sensing, afforestation – mangroves, Artificial roots.

Reference:

1. Sharma, P.D. Ecology & Environment – Meerut: Rastogi Publications, Meerut, 1990.
2. Manivasakam, "Environmental Pollution", New Delhi, Natural Book Trust of India, 1984.
3. Dara. S.S. - Text Book of Environmental chemistry & Pollution control. S.Chand & Company.
4. Biswarup Mukerjee. Environmental Biology.

Environmental Pollution And Eco-Toxicology

Course/Paper: 01MPL24103

Year-I

UNIT – I

Environmental Pollutants – Definition - Classification of pollutants – Causes for pollution – Types of pollution – Air Pollution: Definition – Air pollutants – Causes of Air pollution – Biological Indicators – Ecological effects of Air Pollution – control of Air Pollution. Water Pollution: Definition – Water Pollutions – Causes of water pollution – Ecological effects of water pollution control of water pollution.

UNIT – II

Land Pollution: Definition – Land pollutants – Causes of Land Pollution – Pesticides – Radio activity – Fallows – Radioactive elements – Radiation – Source of Radiation – Natural radiation of man made radiations – Types of Atom Bomb – Internal or external Emitters – Sources of Ionizing radiation – Biological effects of radiations – Control of radioactive pollution – Human Population as Explosion – Issues – Demography – Dispersal – Causes – environmental effect – Waste Management – Types – Solid – Bio remediation.

UNIT – III

Noise Pollution: Definition – Causes of noise pollution – Ecological effects of noise pollution – Control of noise pollution. Thermal Pollution: Definition – Source of Thermal pollution: Definition – Source of thermal

pollution – Ecological effects of thermal pollution – Control of thermal pollution. Pesticide Pollution: Classification – Sources – Impact – Control General Law of control in pollution – Super Bass – Sewage Treatment.

UNIT – IV ECO-TOXICOLOGY

Introduction: Toxicology – Scope of toxicology – Basic division of toxicology – Goals of toxicology – Basic concepts of Toxicology – Factors that affect environmental concentration of Taxicants – Influence toxicity – chemical mixtures – Effect and response Dose – Rasponse relationships – Margin of safety (slope). Toxicity testing. Toxicants of Public Health Hazard: Black lists/ Toxic chemicals – Pesticides – Automobile emissions Heavy metals – Fertilisers – Food additives - Radioactive substances.

UNIT – V BIOLOGICAL MAGNIFICATION OF TOXIC MATERIALS:

Pesticides – microcosms - compartment models. Absorption – Translocation and Excretion of chemicals (xenobiotics) – membranes permeability and mechanisms of chemical transfer Bio-transformation of xenobiotics – Selective toxicity – Reception sites – Types of – D.D.T – anti-dotal procedures in toxicology. Biomonitoring of Toxic chemicals – Monitoring Program Parameters of biomonitoring – Bio-Indicators and Environmental monitoring Bio assay and its applications in toxicology – Enviornmental Legislation and Chemical Safety Evaluation.

Reference:

1. Environmental Health Publication of NEERI – Nagpur.
2. A. Arumugam – Saras Publciation.
3. Dr. Tmt. Bernice Anantharaj – Chrisolite Publciations – Ecology.
4. N.T. Krishna – Environmental Biology.
5. P.D. Sharma – Environmental Biology and Toxicology.
6. Shukia . Upadayan – Economic Zoology.

DISSERTATION

01MPL24201

Marks -100

Each student will submit dissertation on any one topic related to Zoology. Dissertation will be guided by supervisor of the university and will be examined by external.