



MASTERS OF PHILOSOPHY (M. PHIL.)
BOTANY
DETAILED SYLLABUS
SESSION 2013-14



PAPER I

RESEARCH METHODOLOGY THEORY AND TECHNIQUES

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 Hypo Dissertation, 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, Hypo Dissertation, Fundamentals of Hypo Dissertation 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



PAPER-II

BIODIVERSITY

UNIT - I

Biological Diversity – Systematics in Diversity – Environment and Genetic Variations – Nature and Origin; Biological Classification – Phylogenetic Relationship – Enumeration of Biodiversity – Ecological Biodiversity – Species Concept – Biological and Phylogenetic Concepts; Species Inventory – Global Patterns - Biodiversity hot spots. IUCN categories – Red data book.

UNIT II

Species Diversity – Global Distribution of Species – Diversity in terrestrial, marine and freshwater – Micro-organisms-lower and higher plants – lower and higher invertebrates and vertebrates; Species extinction and Endangered species; Monitoring indicator species and habitats; Diversity loss – causes and remediation.

UNIT III

Habitats and Ecosystem – Classification – Ecosystem mapping, tropical forests, grasslands, wetlands, coral reefs, mangroves; Economics of Ecosystem, Green Revolution, Food Plants, medicinal and ornamental plants, animal uses – livestock and fisheries; Biodiversity and Industry – Pharmaceutical – Aquaculture – Apiculture.

UNIT - IV

Conservation and Management – National Legislation – Protection of Wild flora and Fauna - Protection of National Habitats - National and International Protected Areas – Current Practices in Conservation - in *situ* Conservation and *ex situ* Conservation of Threatened Species – Biodiversity Bill 2002 – Patent Act – Agenda 21 – Multilateral Treaties – Biodiversity Conventions.

UNIT - V

Species Diversity – Case Studies – Deciduous Forests - Desert Lizard communities – Coral Reef - Fish Communities -Island species – Environmental ethics – Biodiversity – a Socio – Political Perspective – Western and Eastern Ghats - Himalayas.

Reference:

1. Global Biodiversity – Status of the Earths Living Resources, Brian Groombridge (1992) Chapman & Hall, London
2. Ecology of Natural Resources, Ferancois Ramade (1991), John Wiley.



3. Global Biodiversity and Strategy, IUCN (1992).
4. Biodiversity, Science and Development, Francesco di castri (1996) Backhuys Publishers, The Netherlands.
5. The Biology of Biodiversity, Kato, M (1999), Springer Verlag, Tokyo
6. Biodiversity Conservation – In Managed forest and Protected areas, Kotwal,P.C. and S.Banerjee (2002).Agrobios, India.
7. Global Biodiversity, Sinha,R.K(1997), INA Shree Publishers, Jaipur.
8. Megadiversity Conservation, flora, Fauna and Medicinal Plants of India's hot spots, Chaudhuri, A.B. and D.D. Sarkar (2003), Daya Publishing House, Delhi.

PAPER-III PLANT BIOTECHNOLOGY

UNIT-I:

Plant tissue culture: Cleaning, sterilization, sterile handling of tissue culture of plant. Nutritional requirement for in vitro culture. Concept of cellular totipotency, single cell culture, micro propagation, somoclonal variation and its application for plant improvement, somatic embryogenesis, anther and ovule culture, haploid and double-haploid production.

UNIT-II:

Protoplast culture: Isolation ,fusion and culture, somatic hybridization, selection for hybrids , cybrid production and their application in crop improvement, cryobiology of plant cell culture and establishment of gene banks, production of virus free plants using meristem culture.

UNIT-III:

Plant cloning vectors: Ti and Ri plasmid and viral vectors (CaMV based vectors,Gemini virus, TMV based vectors). Mechanism of DNA transfer, role of virulence genes, use of 35S promoters, genetic markers, use of reporter genes, methods of nuclear transfer, particle bombardment, electroporation, microinjection, transformation of monocots, transgene stability and gene silencing , herbicide , insect and salt resistance , Plant DNA fingerprinting - Hybridization and PCR based markers (RFLP, SSRs, RAPD, QTLS , SCARS , AFLP etc.)

UNIT-IV:



Biological nitrogen fixation and biofertilization, molecular mechanism of nitrogen fixation, genetics of nif gene. Plant diseases- general account, biological control of pests and disease, biopesticides, seed production technique, plant cell culture for the production of useful secondary metabolism-pigments, perfumes , flavor, pharmacologically important compounds, biodegradable plastics. Automation in Plant Tissue Culture for its commercial application.

UNIT-V:

Transgenic plants, commercial status and public acceptance, Bio-safety guidelines for research involving GMO's, benefits and risks. Socio economic impact and ecological consideration of GMO's, Gene flow, IPR and IPP. Patenting of biological.24

Recommended Books:

1. Plant Tissue Culture: Theory & practice a revised edition(2004) Bhojwani & Rajdan
2. Plant Biotechnology (2000),Hammond et al
3. Plant Tissue Culture –Bhojwani, S.S.
4. Plant Cell & Organ culture(2004) Gamberg, O.L
5. Principles of Plant Biotechnology, Montell, et al
6. Plant Cell Culture (2003) Evans D.A.
7. Plant Molecular Biology- vol.I and II, Gimartin & Bowler
8. Genetic Engineering of Crop Plants, Lycett G.W. & Grierson D.

PAPER-IV DISSERTATION