SYLLABUS

PRE-Ph.D. COURSE-WORK (PPC) IN BOTANY

(One Semester Pattern)

(With effect from 2021-2022)

MAHARAJA SRIRAM CHANDRA BHANJA DEO UNIVERSITY
SRIRAM CHANDRA VIHAR
TAKATPUR, BARIPADA-757003

Pre-Ph.D. Course work (PPC) in Botany

With effect from 2021-22

1. The eligible candidates who have qualified or exempted from ET & I (Entrance Test and Interview) for Ph.D. registration have to undertake a Pre-Ph.D. course work (PPC) in the subject.
2. They have to apply in the prescribed format (Appendix-II) after depositing the requisite fee as stipulated by the University.
3. The course work is of one semester (six month) duration and consists of theory, seminar presentation and dissertation work.
4. A candidate shall be required to attend at least 75% of the lecture, seminar and dissertation periods taken separately.
5. After the completion of the PPC, examination will be conducted as per the University schedule.
6. The examination will consist of two theory papers (BOT-801 & BOT-802) each carrying 50 marks with 3 hours duration and a seminar presentation related to dissertation work (BOT-803) carrying 100 marks (Dissertation: 50 marks, Presentation: 30 marks and Viva voce: 20 marks).
7. To pass PPC, a student has to secure at least 50% marks in aggregate.

Programme Outcome:

- The students will acquire basic knowledge on microscopy, computer application, statistical methods, analytical techniques and tissue culture. Students will able to learn the methods of plant community studies. They can also able to learn the techniques of plant identification, herbarium preparation, plant diversity assessment and prioritization of taxa for conservation.
- Students can able to understand the theory and importance of research ethics for their higher education.
- They will be equipped with adequate technical and analytical skill to pursue their future studies and to develop continuous learning throughout their professional career.
- They will be able to complete national and state level tests like UGC-CSIR (NET), ICAR (NET), UPSC, OPSC and SSB etc.
- They will acquire motivational forces for higher study and research related to applied field of plant sciences.

Programme Specific Outcome:

- Students will able to learn the basic principles and applications of scientific instruments in biological research for their higher education.
- They will acquire knowledge for reintroduction and conservation of rare, endangered and threatened (RET) taxa through plant tissue culture technique.
- They will able to know the present status of plant science research and point out the research gaps through their dissertation work.

Outline of the Syllabus

Paper code	Course Title	Credit	Marks
BOT-801	Research Methodology-I (Theory)	05	50
BOT-802	Research Methodology- II (Theory)	05	50
BOT-803	Dissertation of a review work to be evaluated through seminar presentation	10	100
	Total	20	200

Course Code: BOT-801

Marks-50 Course Title: Research Methodology-I (Theory) Credits-5

Course objectives: To acquire knowledge on research methodology basically on microscopy, the application of computer in biological research and data analysis. The students will be able to learn how to study scientific literature, research ethics, writing research proposal, dissertation and Ph. D. thesis.

Unit- I: Research Theory: Meaning of Research, Objective of Research, Types of Research, Significance of Research, Research Methods, Research Process, Criteria of Good Research.

Unit- II: Basics of Research Practice: Writing of Research Papers, Abstracts and Review Papers, Dissertations and Thesis Writing, Developing Research Proposals, Delivering of Effective Oral Presentation, Preparation and Presentation of Posters.

Unit-III: Research Ethics: Introduction, Objective of Research Ethics, General Ethics, Philosophy of Research Ethics, History of Research Ethics, Theory of Research Ethics, Ethics Committee, Principles/ Policies of Research Ethics, Publication Ethics, Impotence of Research Ethics, Ethical Issues in India.

Unit-IV: Basic Methods in Biology: Microscopy-Principles and Working of light and Compound Microscopes, Phase Contrast, Fluorescent and Electron Microscopes (SEM & TEM), Micrometry, Photomicrography and Microphotography, Fixation and Staining Techniques.

Unit-V: Computer and Information Methods: MS Word, MS Excel, MS Power Point, Internet Latex, Bibliography tools, Checking similarity using Plagiarism Detection Software.

Course Outcome: Upon successful completion of the course, students will be able to acquire knowledge on research methodology basically on microscopy, computer and information methods. The students will be able to learn, how to study scientific literature, research ethics, writing research proposal, dissertation and Ph. D. thesis. They can also know the better way of scientific communication.

Recommended Books:

1. Research Methodology: Methods and Techniques by C.R. Kothari and G. Garg, New Age International Publishers, New Delhi.
2. Research Methodology by Ranjit Singh, RT Publications, Chandigarh.
3. Research Methodology by R.Cauvery, U.K.S. Nayak, M. Girija and R. Meenakshi, S. Chand & Company Pvt. Ltd., New Delhi.
4. Research Methodology by S. Sachdeva, LNA publisher, New Delhi.
5. Research Methods, Design and Analysis by Larry B Christensen, R. Burke Johnson and Lisa A. Turner, Pearson India Publisher, New Delhi.
6. Research Methods, Statistics and Computer Application Abdul Matin, ABS Book India Publication, New Delhi.

Course Code: BOT-802

Marks-50 Course Title: Research Methodology-II (Theory) Credits-5

Course objective: To know the methods and techniques of plant tissue culture along with the principles and applications of scientific instruments and statistics in biological research. Students can also able to know the methods of plant identification, preservation and plant community study.

Unit I: Culture Techniques:- Sterilization Techniques, Preparation of Culture Media, Isolation and Pure Culture, Preservation Techniques, Tissue Culture Techniques (Tissue culture media, its composition, selection & preparation).

Unit II: Analytical Techniques: Principles and Application of Spectrophotometry, Centrifugation, Chromatography, Electrophoresis and Tracer Techniques.

Unit III: Methods in Plant Taxonomy: Herbarium Concept, Function and Management, Different Methods of Plant Identification, Botanical Keys-Types; and Structure of Botanical keys, Methods of Construction of Key, Biodiversity-Concept, Status and Documentation, Assessment, Prioritization and Conservation of Taxa.

Unit IV: Methods and Techniques in Plant Community Studies: Floristic Composition, Life-forms, Biological Spectrum, Species Area Curve, Analysis of Frequency, Density and Abundance, Important Value Index, Biomass and Primary Productivity.

Unit-V: Biometry: Graphical Representation of Statistical Data, Measures of Central Tendency, Variance and Standard Deviation, Correlation and Regression Analysis, Test of Significance based on small samples, X^2 (Chi-Square), t-test, Analysis of Variance (ANOVA).

Course Outcome: By learning this course students will be able to know the methods and techniques of plant tissue culture along with the principles and applications of scientific instruments and statistics in biological research. Students can also know the techniques of plant identification, preparation and preservation herbarium including plant community study.

Recommended Books:

1. Research Methodology: Theory and Techniques by J. R. Raiyani, New Century Publications, New Delhi.
2. Research Methodology by Ranjit Kumar, SAGE Publications India Pvt. Ltd., New Delhi.
3. Research Methodology and Biostatistics by S.K. Sharma, Elsevier Publications.
4. Research Methodology: Concepts and Cases by Deepak Chawla and Neena Sodhi, Vikas Publishing House, New Delhi.
5. Research Methodology and Applied Statistics by D.N. Sansanwal, Shipra Publications, New Delhi.

Course Code: BOT-803
Dissertation of a Review Work

Credit: 10 **Mark: 100**

Each student is required to submit a dissertation on review work in any field of Botany under the supervision of a faculty before the commencement of theory examination. The dissertation will be evaluated by the external and internal examiner based on the dissertation (50 marks), presentation (30 marks) and Viva voce (20 marks).