

EXAMINATION IN THE FACULTY OF LIFE SCIENCE

Ph.D. (BOTANY) COURSE WORK

Scheme and Course

(As per Ordinance No. 11, 2018, Item no.11 (e) and (f))

S. No	Paper	Nomenclature	Credits	Marks
1	Paper-I: BOT CW 01	Research Methodology	4	100 (60+ 40 CCE)
2	Paper-II: BOT CW 02	Review of published research in the relevant field	3	100 (60 Written report + 40 Oral presentation)
3	Paper-III: BOT CW 03	Computer Applications	3	100 (60+ 40 CCE)
4	Paper-IV: BOT CW 04	Advance course (Botany)	3	100 (60+ 40 CCE)
5	Paper-V: BOT CW 05	Comprehensive viva voce	3	100
		Total	16	500

- Notes:**
1. The candidate has to obtain a minimum of 55% of marks or its equivalent grade points in aggregate in the course work in order to be eligible to continue in the Ph.D. programme.
 2. If candidate obtains 'F' or 'Ab' grade in the course/ subject, he/ she will be treated to have failed in that course. He/ She has to reappear in the examination in the next semester.
 3. If candidate further fails in the course, he/ she shall not be given another chance and shall be out of the Ph.D. programme.

Kumar
1/5/19

Paper-I: BOT CW 01. Research Methodology Credits- 4. Marks-100 (60+ 40 CCE)

Unit 1. Introduction, aims and objectives of scientific research: Types of research. Formulation of research problem. Hypothesis generation and testing. Data collection. Primary and secondary data.

Unit 2. Research Ethics : Ethical norms. Misconduct in research. Data management. Conflict of interest. Publication. Authorship. Peer review. Plagiarism and its detection. Collaboration. Social responsibilities. Whistle blowing.

Unit 3. Quantitative analysis : Introduction and need of quantitative techniques. Data analysis and presentation. Frequency distribution. Measures of Central tendency and dispersion. Normal, Binomial and Poisson distributions. Sampling techniques. Testing of significance.

Unit 4. Correlation and Regression. T-test, Chi square test. Experimental designs. R.B.D. and other designs. Analysis of variance. Probability and its types.

Unit 5. Research Paper writing : Research paper writing, steps and process. Paper submission (off line and online) to journals. Types of journals. Peer review process. Paper presentation. Report writing. Thesis writing, important considerations. Poster presentation.

References :

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International, 418p.
3. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, EssEss Publications, 2 volumes.
4. Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing, 270p
5. Suedecor, GW and Cochran, WG (1968) 'Statistical methods' Oxford & IBH, Delhi.

Paper-II: BOT CW 02. Review of published research in the relevant field

Credits -3. Marks- 100 (60 Written report + 40 Oral presentation)

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Paper-III: BOT CW 03. Computer Applications

Credits-3. Marks- 100 (60+ 40 CCE)

Unit 1. Introduction to computers. Structural and functional aspects. Commonly used programmes and packages. MS Word : Features and applications related to presentation of text in suitable format, saving the data.

Unit 2. MS Excel : Features, construction and applications. Preparation and presentation.

MS Power Point : Preparation of Power point presentation (insertion of text, figures, charts, photographs etc.) and its usefulness.

Unit 3. Internet and its applications in research. Networking principle. Exploring various websites for collecting literature related to research work. Use of statistical tools like SPSS for analyzing and interpretation of data.

Unit 4. Data mining from databases. Important software used in biology. New technologies. Mobile Computing Mobile Connectivity-Cells, mobile data internetworking, cellular data communication , mobile computing application, Mobile database-Protocol, scope, tools, and technology.

Unit 5. Bioinformatics. Use of tools (FASTA, BLAST, RASMOI, etc.). Important databases PUBMED, GENBANK etc.). Sequence alignment tools. Phylogenetic analysis.

References:

- 1). Fundamentals of Computers by Rajaraman, Prentice Hall India Pvt. Limited
- 2). Microsoft Office Word 2007: Complete Concepts and Techniques by Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat, Cengage Learning Inc.
- 3). How to Do Everything with Microsoft Office Excel 2007 by Guy Hart-Davis, McGrawHill
- 4). Learning Microsoft PowerPoint 2007 by Catherine Skintik, Pearson Education
- 5). H.H. Rashidi & L.K Buchler (2002). Bioinformatics Basics: Applications in Biological Science and Medicine, CRC Press, London.

Review
11/5/19

**Paper-IV: BOT CW 04. Advance course (Botany) Credits-3. Marks- 100 (60+ 40 CCE)
(Research Methodology in Botany)**

UNIT-1

1. Plant Tissue Culture techniques- types, Media Preparation, Protocols for different culture, Aseptic Conditions, Sterilization methods.
2. Microbial Culture techniques- Media Preparation, Protocols for different culture, Sterilization methods, MPN techniques.

UNIT-2

1. Cytological techniques- Pretreatment, Fixatives and Stains.
2. Recent Molecular cytological techniques- FISH, GISH etc.
3. Principles, methods and types of Electrophoresis. Agarose and PAGE Electrophoresis.

UNIT-3

1. DNA Isolation techniques from plant and animal tissue, microbes.
2. PCR- Principles, types and applications.
3. Basic Gene Cloning Techniques used in genetic transformation of plants.
4. DNA Chips, Microarray and newer techniques in genomics.

UNIT-4

1. Principles, Nature, detection, measurement and applications in biological sciences of Radioisotopes.
2. Introduction to Remote Sensing and Geographical Information System.
3. Basic enzymes assay methods.

UNIT-5

1. Sampling techniques and analysis of air Pollution.
2. Techniques and analysis used in the study of water Pollution.
3. Herbarium preparation methods in ethno-botanical studies.

Paper-V: BOT CW 05. Comprehensive viva voce

Credits-3. Marks- 100

Neema
11/5/19