



Hemchandracharya North Gujarat University, Patan

PH.D. COURSE WORK SYLLABUS

SUBJECT : BOTANY

Scheme & Course

Sr.	Paper	Nomenclature	Credits	Marks
1.	Paper-I - BOT-CW-101	Research Methodology	04	70+30
2.	Paper-II - BOT-CW-102	Advance course in Botany	04	70+30
3.	Paper-III - BOT-CW-103	Computer Applications to the subject	04	70+30
4.	Paper-IV - BOT-CW-104	Review of published research in the relevant field	04	70+30
6.	Paper-V - BOT-CW-105	Comprehensive Viva	04	100

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.

Paper-I	BOT-CW-101	Research methodology	Credit-4	(70+30)
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UNIT-1	Introduction, aims and objective 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. Authoship. 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 distribution. Samling 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 writng, 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.

Reference:

1. Garg, B.L. Kaeadia, R. Agrawal. F. anf Agrawal. U.K. 2002. An introduction to research methodology, RBSA Publishers.
2. Kothari. C.R. 1990 Research methodology and Techniques. New Age.
3. Sinha. S.C and Dhiman. A.K.2002. Research methodology. EssEss Publications. 2 volumes.
4. Teochim, W.M.K 2005 Research methos: the concise knowledge base, Atomic Dog Publishing. 270p
5. Suedecor. GW and Cochram. WG (1968) 'Statistical Methods' Oxford & IBH, Delhi.

Unit-1

1. Plant Tissue Culture techniques – types Media Preparation, Protocols for Different Culture. Aseptic Conditions. Sterilization methods.
2. Microbial Culture techniques – Media Preparations. 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 technique 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 technique and analysis of air Pollution.
2. Techniques and analysis used in the study of water Pollution.
3. Herbarium preparation methods in ethno-botanical studies.

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 networking, cellular data Communication, mobile computing application. Mobile database-Protocol, scope, tools and technology.

UNIT-5

Bioinformatic use of tools (FASTA, BLAST, RASMOI etc.). Important databases PUBMED. GENBANK etc.). Sequence alignment tools. Phylogenetic analysis.

References:

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

Paper-IV	BOT-CW-104	Review of published research in the relevant field	Credit-4 (70+30)
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For this paper candidates will have to review literature in an area of research, prepare a research proposal and submit a report to the University at the end of the course work. The selection of the problem and preparation of the proposal will be in consultation with research guide.

Paper-V	BOT-CW-105	Comprehensive viva voce	Credit-4 (100)
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Candidate will face a Comprehensive Viva-Voce of 4 credits on the subject of Research Methodology, Advanced Course in Botany and literature review report submitted to the university. The Presentation will have to be made by the candidate and it will need to be prepared in consultation with research guide.

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