

UNIT-I: Sampling technique, sterilization technique, various methods for isolation of pure culture methods for measurement of microbial growth, manipulation of environment, nutritional and genetic parameters, maintenance and preservation of microbes (pure culture); General concepts of microscopy, bright field, darkfield, electron microscopy, modern tools in microscopy

UNIT-II: General concepts of plants collection from nature, sampling, cataloguing, preservation, herbarium techniques. Quantitative methods; Principles and Designs of Experiments; Tools Parametric and Non-parametric statistics. Probability, Chi square test, t-test, Confidence interval, Errors. Levels of significance, Regression and Correlation coefficient. Analysis of variance for one way and two way classifications; Multiple Comparisons – Least Significant Difference Test, Duncan's New Multiple Range Test; Factorial Analysis; Analysis of Covariance.

UNIT-III: Chromatographic techniques – Gel filtration, ion exchange chromatography, hydrophobic interaction and reverse phase chromatography, affinity chromatography, gas chromatography, high performance liquid chromatography, fast protein liquid chromatography; Application in separation of proteins including enzymes.

UNIT-IV: Basics of Electrophoretic and centrifugation techniques - SDS and Native PAGE, Agarose gel electrophoresis, isoelectric focusing and two-dimensional electrophoresis, proteome analysis; 2 Differential and density gradient centrifugation, analytical ultracentrifugation, separation of DNA/RNA using ultracentrifugation technique, determination of molecular weight and Sedimentation coefficient, Blotting techniques.

UNIT-V: Scientific writing, types of citation, literature search, graphical abstracts, peer review. Research proposal and report writing, format and structure of research paper. Major research Institutes and funding agencies related to plant sciences.


SUGGESTED READING:

1. Marder M P (2011) Research Methods for Science, Cambridge University Press
2. Rosner B (2010) Fundamentals of Biostatistics, 7th Edition, Brooks/Cole Cengage Learning Publication
3. Dunleavy P (2003) Authoring a PhD: How to Plan, Draft, Write and Finish a Doctoral Thesis or Dissertation. Palgrave Macmillan
4. Kothari, C.R.(2004). Research Methodology: Methods and Techniques, New Age International Publishers, New Delhi
5. Arya., P.P. and Pal, Y.(2001) Research Methodology in Management: Theory and case Studies. Deep and Deep Publishers Pvt. Ltd., New Delhi

Part B: Botany

Syllabus for Ph.D Entrance Examination 2023-24

- General account and economic importance of algae, fungi, bryophytes, pteridophytes and gymnosperms (including fossil records).
- Taxonomy, anatomy and embryology of angiosperms.
- Cell biology, genetics and evolutionary biology.
- Plant biochemistry, plant physiology, and biochemical and molecular techniques.
- Ecology, conservation biology, island biogeography and climate change.
- Molecular genetics, genetic engineering and biotechnology.
- Plant resource utilization, cytogenetics, plant breeding and biostatistics.
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HEAD
DEPARTMENT OF BOTANY
D.D.U. GORAKHPUR UNIVERSITY
GORAKHPUR-2 2009