

Board of Studies Meeting in Botany, Kumaun University, Nainital

Minutes of the Board of Studies meeting (April, 28, 2018) held in Administrative Block, Kumaun University, Nainital on April, 28, 2018.

Members of the BOS resolved the following:

The B.Sc./B.Sc. Honours and M.Sc under CBCS Syllabi discussed and the improvement is suggested by the members.

After the detailed discussion with the members of Government colleges, the members suggested that already approved M.Sc curriculum under CBCS would be implemented from the next session ⁽²⁰¹⁹⁾ in both the university campuses only. At UG level it should be applied after the successful implementation at PG level.


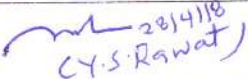

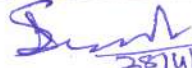



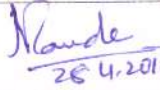


The curriculum of Pre-PhD course, Paper II (Recent Advances in Plant Sciences) and Ph.D. entrance test ~~was~~ discussed and revised.

The list of examiners for paper setting, practical is recommended. The convener is authorized to add any name in the list (mentioned above) of examiners in case of urgency

The members also suggested that admissions at PG and UG level should be done through Entrance Examination.

The revised curricula as per suggestions will be submitted by the convener.

The meeting was concluded with the vote of thanks by the convener (Professor Neerja Pandey).

1.	 28/4/18 (Uma Melkania)	6.	 28/4/18 (C.S. Rawat)
2.	 28.4.18 (A.K. Maurya)	7.	 28/4/2018 (S.S. Bargali)
3.	 28/4/18 Dr. S.S. Maurya	8.	 28-4-2018 (S.C. Sati)
4.	 28-4-18 (Dr. A.K. Pathiwal)	9.	 28.4.2018 (Neerja Pandey)
5.	 28/4/18 P.C. Pant	10.	 28.4.18

Revised

Syllabus of Ph.D. Entrance Examination 2019 onward

16. BOTANY

- 1. Biology and Diversity-I:** Microbes, Lichens, Algae and Fungi, Characteristics and ultra-structure of Viruses, General characteristics of lichen and its economic importance, General concept of Algae including economic importance, General characteristics of fungi, parasexuality; Mycorrhizae; Mycotoxins; fungi as biocontrol agents, economic importance of fungi; Fungal diseases in plants; types of pathogens; symptoms of different diseases; methods of disease control.
- 2. Biology and Diversity-II:** Bryophyta- Modern system of classification upto molecular level; morphological, ecological characteristics and economic importance. Pteridophyta- General features, stellar evolution, Telome theory, evolution of sorus, Heterospory and seed habit. Paleobotany- Types of fossils; fossil formation, geological time scale.
- 3. Gymnosperm and Angiosperm:** General Introduction and distribution of Gymnosperms, structure and reproduction of Cycadales, Coniferales, Ginkgoales. The species concepts, Salient features of international code of nomenclature (ICN), Taxonomic evidences, Bentham & Hooker, Hutchinson and Takhtajan Systems of classification : Some important families viz. Ranunculaceae, Rosaceae, Asclepiadaceae, Fabaceae, Solanaceae, Asteraceae, Lamiaceae, Orchidaceae, Poaceae, Concepts of phytogeography: Endemism, plant migration.

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- 4. Cell and Molecular Biology:** Structural organization of the plant cell, Structure and function of cell wall, and other cell organelles, nucleus, DNA structure, ribosomes, cytoskeleton, Structure and Genomic organization of chloroplast and mitochondria, Cell cycle check points and role of cyclin and cyclin dependent kinases, Antigen and antibody, Types of Immunity, immunodiffusion and Radial immunodiffusion.
- 5. Biotechnology:** General concept of Biotechnology, Concepts of cellular differentiation, Totipotency, Organogenesis, Micro propagation, Somatic embryogenesis, tissue culture techniques, artificial seeds, secondary metabolites, somaclonal variation, application of plant tissue culture, Industrial biotechnology, Biofertilizers, Recombinant DNA Technology, Genomics
- 6. Plant Ecology:** Major biomes of the world, Vegetation organization, Ecological succession and concept of climax, structure and function of Ecosystem, energy flow pathways, biogeochemical cycles of C, N, and P, Biological diversity, Environmental pollution, Climate changes: Greenhouse gases (CO₂, CH₄, N₂O, CFCs, sources, trends and role), Ozone layer and Ozone hole, consequences of climate change.
- 7. Cytology, Genetics and Plant Breeding:** Chromosome structure, Structure and numerical alteration in chromosomes, Genetics of prokaryotes and eukaryotic organelles, Gene structure and expression, Genetic recombination and gene mapping, Mutation, Molecular Cytogenetics, Alien gene transfer of whole genome.
- 8. Plant Physiology & Metabolism:** Fundamental of enzymology, Membrane transport and translocation of water and solutes, Signal transduction, Photosynthesis, Respiration ; Photorespiration ; and lipid metabolism, Phytochromes, Plant growth regulators, Photoperiodism, Vernalization., Stress physiology

9. Plant Development and Reproduction: Development of plant, Shoot development, Leaf growth and development, Stomata development, Root development, Reproduction, Male and female gametophytes, Pollination and fertilization, Seed development and fruit growth, Senescence and programmed cell death (PCD)

10. Plant Resource Utilization and Conservation: Plant biodiversity and sustainable development, World centers of primary diversity of domesticated plants, Green revolution, Strategies for conservation – In-situ and Ex-situ conservation, Botanical gardens, Seed banks, in-vitro repositories; Cryobanks.

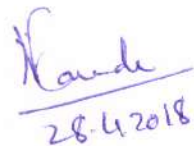

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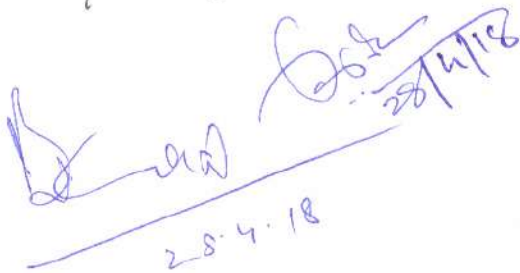

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Revised
Syllabus for Ph.D. Course Work in Botany

(Paper II: Recent Advances in Botany 2018-Onwards)

1. Microbes and Mycorrhiza and their significance.
2. Biodiversity assessment and conservation: Distribution pattern, endemism, resource utilization and conservation.
3. Modern trends in taxonomy with special reference to Biosystematics.
4. Ecosystems: Diversity and Management with special reference to the Himalaya.
5. Genetic engineering and its implications: Gene isolation, enzymatic synthesis of gene, transgenic crops, PCR (Polymerase Chain Reaction).
6. Biotechnology: Scope and importance of biotechnology, tissue culture techniques in biotechnology, biotechnology in medicine and agriculture.
7. Traditional knowledge and IPR.

Suggested Readings:

1. Mitra, Sandhya (1996) Genetic Engineering. Mc-Millan India Co. Ltd., New Delhi.
2. Gupta, P.K. (2001). Elements of Biotechnology. Rastogi Publications, Meerut, Pp:1-13.
3. Odum, E.P.(2000). Fundamentals of Ecology. Thomson Asia Pvt. Ltd., Singapore.
4. Ricklefs, Robert, E. and Gary L. Miller (2009). Ecology (IVth edition). W.H. Freeman and Company, New York.
5. Chawala, H.S (2006). Introduction to Plant Biotechnology. Oxford and IBH Pub. Co., New Delhi.
6. Naik, V.N. (2001). Taxonomy of Angiosperms. Tata MC Graw- Hill Pub. Co. Ltd., New Delhi.
7. Christian Leveque and Jean-Claude Mounoluv. – Biodiversity, John Wiley & Sons, Ltd.
8. Smith, S.E. & D.J. Read- Mycorrhizal Symbiosis. Academic Press.
9. Mahendra Raj & Ajit Verma – Diversity and Biotechnology of Ectomycorrhiza.

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