SWAMI VIVEKANAND GOVT P.G. COLLEGE LOHAGHAT (CHAMPAWAT)

DEPARTMENT OF BOTANY

Teaching Action Plan M.Sc II SEMESTR Academic session 2021-22

PAPER V Gymnosperm and Palaeobotany

UNIT	CONTENT OF SYLLABUS	REQUIRED PERIOD
01	Introduction: History, classification, distribution and evolution of Gymnosperms.	03
02	Brief account of the families of Pteridospermales (Lyginopteridaceae, Medullosaceae, Caytoniaceae and Glossopteridaceae) and Cycadeoideales.	01
03	General account of Cordaitales.	03
04	General account of Pentoxylales.	06
05	Morphology, anatomy and reproduction in Cycadales, Ginkgoales and Coniferales.	04
06	General account of Ephedrales, Welwitschiales and Gnetales.	03
07	Preservation of fossil plants. Types of fossils, modes of formation of different kinds of fossils, Gondwana flora.	04

NOTE- Number of period for completion of above mentioned content of syllabus may be increase or decrease during online classes.

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(NEW SUYLLABUS)

BOT.201 PAPER VIII Cell and Molecular Biology

UNIT	CONTENT OF SYLLABUS	REQUIRED PERIOD
01	**Cell wall:** Structure and functions, biogenesis.	04
02	**Plasma Membrane:** Structure, models and functions, plasmodesmeta and their role in movement of molecules and macromolecules.	05
03	**Chloroplast:** Structure and genome organization and transcription	05
04	**Mitochondria:** Structure, genome organization, biogenesis, RNA editing.	05
05	**Plant vacuoles:** Tonoplast membrane, ATPase, storage organelles.	03
06	**Nucleus:** Structure, DNA structure, A, B and Z forms, nuclear pores, nucleosome organization.	03
07	**Ribosomes:** Structure, protein synthesis, mechanism of translocation, Initiation and termination.	06
08	**Cell shape and motility:** The cytoskeleton, organization and role of microtubules and microfilaments.	04
09	**Cell cycle and Apoptosis:** Role of cyclins and cyclin-dependent kinases, cytokinesis and cell plate formation.	06
10	**Other cellular organelles:** Structure and functions of microbodies, Golgi apparatus, lysosomes, endoplasmic reticulum.	04
11	**Techniques in cell biology:** Immunotechniques, FISH, GISH, confocal microscopy.	03

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PAPER XIII Plant Resource Utilization and Conservation

UNIT	CONTENT OF SYLLABUS	REQUIRED PERIOD
01	**Sustainable development:** Basic concepts.	02
02	World centres of primary and secondary diversity of domesticated plants.	04
03	**Uses of important plants** (i) Food, forage, fodder and fibre crops. (ii) Medicinal and aromatic plants and (iii) Vegetable oil yielding plants.	05
04	**Important fire-wood and timber-yielding plants and non-timber forest products (NTEPs)** such as bamboos, rattans, raw materials for paper-making, gums, tannins, dyes, resins and fruits.	05
05	**Green revolution:** Benefits and adverse circumstances.	03
06	Plants used as avenue trees for shade, pollution control and aesthetics.	03
07	Conservation of plant biodiversity: Principles of conservation, extinction, environmental status of plants based on international Union for conservation of Nature (IUCN).	06
08	Strategies for *in-situ* conservation: International efforts and Indian initiatives; protected areas in India- sanctuaries, national parks, biosphere reserves, wetlands, mangroove and coral reefs for conservation of wild biodiversity.	04
09	Strategies for *ex-situ* conservation: Principles and practices; botanical gardens, field gene banks, in vitro repositories, cryobanks; general account of the activities of Botanical Survey of India (BSI), National Bureau of Plant Genetic Resources (NBPGR), Indian Council of Agricultural Research (ICAR), Council of Scientific and industrial Research CSIR), and the department Biotechnology (DBT) for conservation, non-formal conversation efforts.	06

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Teaching Action Plan **M.Sc IV SEMESTR** **Academic session 2021-22**

PAPER XIV Elective Course/ Special paper (ii) Plant Pathology

UNIT	CONTENT OF SYLLABUS	REQUIRED PERIOD
01	History of plant pathology in India: Losses caused by pathogens and pests; types of pathogens; symptoms of different diseases.	04
02	**Inoculum:** Inoculum types, theory of inoculum, survival and longevity of inoculum, inoculum production, liberation, potential and density	05
03	**Plant-microbe interaction:** Molecular basis of host recognition, pathogenesis: prepenetration, penetration and post penetration events, and factors affecting disease development (host factors, environmental factors, virulence and susceptibility).	05
04	**Genetics of host parasite interactions:** Concepts of compatibility and specificity, genefor-gene relationship, genetics of resistance, sources of resistance, inheritance of resistance in the host.	05
05	**Dissemination of pathogens:** Means of dissemination (active and passive dissemination).	03
06	**Enzymes and toxins:** Enzymes involved in disease development; toxins and their role in plant health.	03
07	**Physiology of diseased hosts:** Changes in physiological processes, e.g., respiration, photosynthesis and disturbance in other metabolic pathways.	04
08	**Disease resistance:** (i) Protection (structural, chemical, absence of nutrients and common antigens) (ii) Defence (histological defence, chemical-polyphenols, prohibitins, inhabitins, phytoalexins and lectins), (m) Genetic resistance: resistant genes.	04
09	**Seed pathology:** Seed borne pathogens, mechanism of seed infection in field and during storage, transmission of pathogens through seeds, seed health testing methods, storage disease of seeds and their control, market diseases of fruits and vegetables.	06
10	**Disease control:** Cultural practices, chemical methods (insecticides, systemic and nonsystemic chemical), biological control: introduction, biological control of insects and pests, use of resistant varieties, integrated management for disease control, quarantine	04
11	**Brief account, structure, importance, disease cycle and control of the following:** (i) Damping off, (ii) Wilt, (m) Root rot, stem rot and fruit rot, (iv) Mildews (powdery and downy), (v) Rusts, (vi) Smuts, (vii) Leaf spots and leaf blights.	06
12	General characteristics, importance, disease cycle and control of the following: (i) bacterial disease, (ii) viral disease, (m) mycoplasma disease.	04

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Teaching Action Plan **BSC II SEMESTR** **Academic session 2021-22**

(NEW SUYLLABUS)

BOT.201 PAPER III PTERIDOPHYTA AND GYMNOSPERM

UNIT	CONTENT OF SYLLABUS	REQUIRED PERIOD
01	Introduction and salient features of Pteridophyta and economic importance.	03
02	Alternation of generation in Pteridophyta.	01
03	Classification of Pteridophyta(Bierhort) upto order level pointing out the features of special significance of each class	03
04	Studies on Rhynia, Lycopodium, Selaginella, Equisetum, Adiantum on the basis of morphology and anatomy of vegetative plant body, spore producing organs and sexual reproduction.	06
05	Stelar system, heterospory, seed habit and Telome theory.	04
06	Introduction and salient features of Gymnosperms and their place among the plant kingdom.	03
07	Classification of gymnosperms upto order level pointing out the features of special significance of each class.	04
08	Alternation of generation in Gymnosperms	02
09	Comparative study of Cycas, Pinus and Ephedra on the basis of morphology and anatomy of the vegetative plant body, sporophylls (their arrangement) and sporangia, spores, male and female gametophytes, pollination, fertilization, embryology and seed germination.	06
10	Fossils, their types and process of fossilization	03

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(OLD SUYLLABUS)

BOT.603 PAPER XVIII BIOTECHNOLOGY

UNIT	CONTENT OF SYLLABUS	REQUIRED PERIOD
01	Introduction to Biotechnology: Role in modern life, history and ethical issues connected with Biotechnology.	04
02	Genetic Engineering: Enzymes and vectors involved in genetic engineering, Recombinant DNA technology, tools and techniques of genetic engineering.	04
03	Plant tissue culture technique: Basic requirements of Tissue culture Laboratory, different types of media and their composition, basic technique of tissue culture, types of culture on the basis of explants, collection and storage of germplasm (Cryopreservation), PTC with reference to somaclonal variations, synthetic seeds, somatic hybridization and hairy root culture.	12
04	Industrial Biotechnology: With reference to drinks and beverages.	04
05	Agricultural Biotechnology: Crop (yield /quality) improvement, bio fertilizers and biological control.	04
06	Biotechnology with regard to microorganisms: Mycotoxin based health hazards and their control, single cell protein.	04

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(NEW SUYLLABUS)

BOT.402 PAPER VIII GENETICS AND PLANT BREEDING

UNIT	CONTENT OF SYLLABUS	REQUIRED PERIOD
01	Structure and function of nucleic acid: Structure of DNA & RNA, different forms of DNA (A, B, Z)	04
02	Genetic code: properties of genetic code, classical and modern concept of gene.	04
03	Law of inheritance: Mendel's experiments, principle of segregation, independent assortment, incomplete dominance.	04
04	Chromosomal aberration: structural (deficiency, duplication, inversion & translocation) and numerical (euploidy & aneuploidy), alteration in chromosomes.	06
05	Sex determination: sex chromosomes, sex determination in Drosophila, Man and plants specially Melandrium.	04
06	Sex linked inheritance	03
07	Gene Interaction- Complementary, Epistasis (Dominant & Recessive), Supplementary	05
08	Plant breeding: aims and objectives, basic techniques of plant breeding (selection, plant introduction and acclimatization, hybridization and mutational breeding), hybrid vigour.	06
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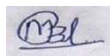

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