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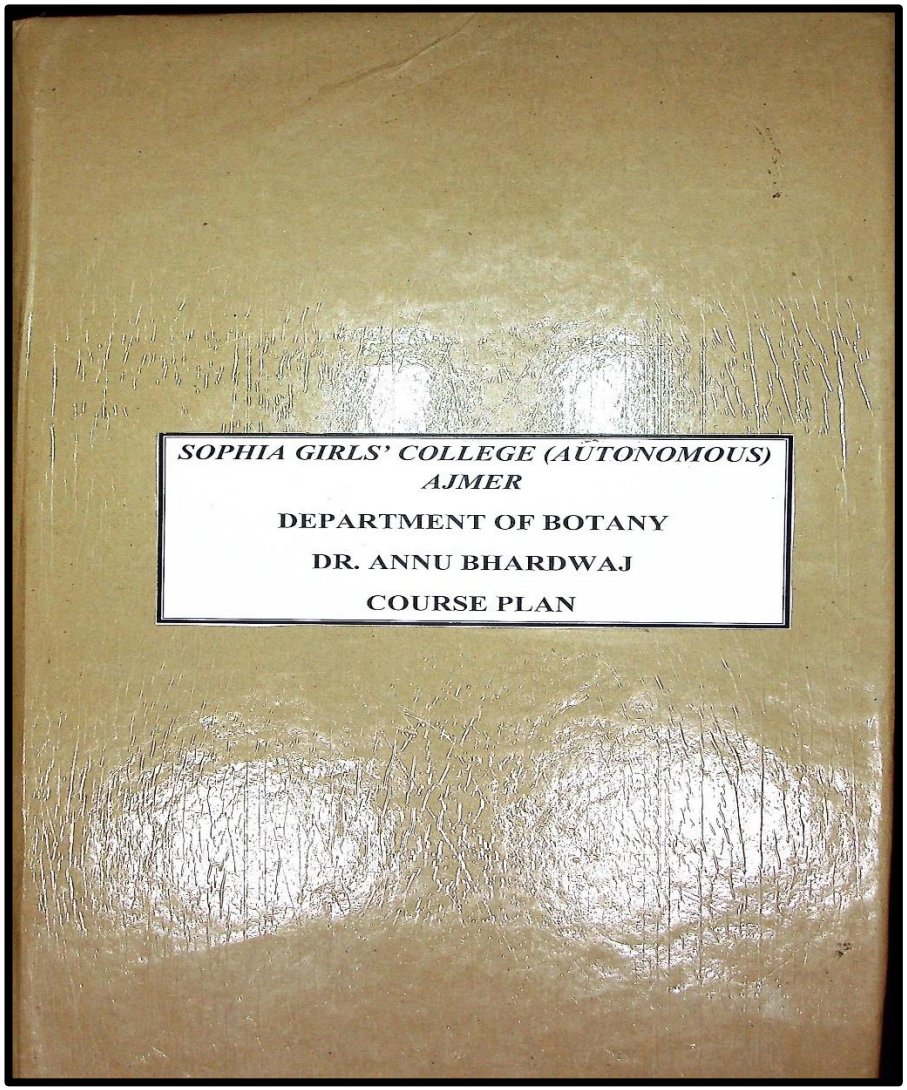
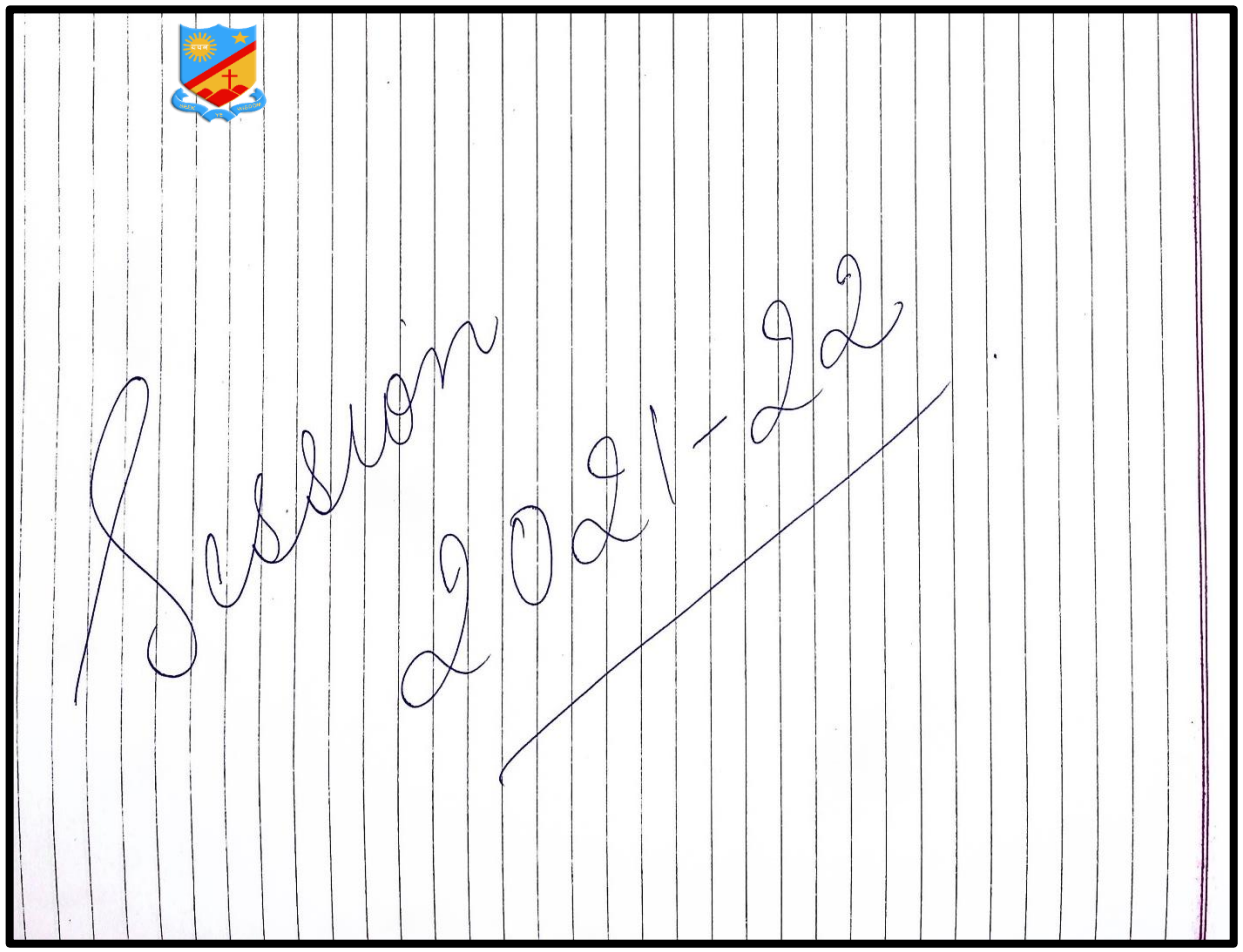


COURSE_PLAN_2021-22_Dr._ANNU_BHARDWAJ


Session
2021-22

SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)

B.Sc. I (SEMESTER I)

ALGAE,FUNGI AND LICHENS (PAPER I) (BOT 101)

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 03

COURSE PLAN

SEM I Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEPTEMBER	UNIT I Algae- General characters, Thallus organisation, Pigments, Reserve food material	General characters of algae , types of thallus in algae , types of pigments and reserve food in algae	E- learning Power Point presentation cum lecture method	Categorize organisms as algae, fungi and lichens	*Knowledge Based* -Give examples from plant kingdom having thallus like body ? -Write about types of pigments in different classes of algae. *Understanding Based* -Illustrate characters of different classes of algae on basis of reserve food, pigments and reproduction type -Elaborate types of asexual reproduction in lichens with help of diagrams.	Knowledge--60 Understanding-30 Higher Order-10
	Classification (Fritsch), Economic importance, Algal bloom and Types of life cycle.	Classification of algae and general characters of all 11 classes. Positive and negative aspects of algae. Lifecycles types	PPT cum lecture E-content (Videos)			
	A General account of lichens	General characters of lichens and three types of lichens and their morphology.	PPT cum lecture . audio tutorials			
OCTOBER-DECEMBER	UNIT II Important features and life history of: Cyanophyceae-	Characteristics of classes of algae and thallus structure and	PPT cum Lecture, assignments,	Appreciate the diversity of life forms		

	Nostoc, Oscillatoria	mode of reproduction in different genus	Test (Google form)		*Higher Order Thinking Skills Based* Differentiate life cycle Puccinia and Agaricus with special reference of spore formation -Illustrate characteristics of omycetes and compare it with basidiomycetes	
	Chlorophyceae- *Volvox, Oedogonium*	Thallus organisation and life history of some members of chlorophyceae	Diagrams, PPT cum lecture method			
	Xanthophyceae- *Vaucheria* Phaeophyceae- *Ectocarpus* Rhodophyceae- *Polysiphonia*	Thallus organisation and life history of members of Xanthophyceae, Phaeophyceae and Rhodophyceae	Diagrams, PPT cum lecture method			
JANUARY-FEBRUARY	**UNIT III** **Fungi-** General characters, Classification (Alexopolous & Mims, 1979), Economic importance, Heterothallism, Parasexuality	Characteristics of Fungi, Classification ,Positive and negative uses of fungi and general terms related with fungi	Diagrams, PPT cum lecture method, assignments,	Understand phylogenetic relationship, ecology and economic importance of algae, fungi and lichens		
FEBRUARY	**Important features and life history of** Mastigomycotina- *Phytophthora* Zygomycotina- *Mucor* Ascomycotina- *Eurotium, Peziza* Basidiomycotina- *Puccinia, Agaricus*	Important features and life cycle of genera of different classes of fungi	Diagrams, PPT cum lecture method, videos, group discussion			

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B.Sc. II (SEMESTER III)

TAXONOMY OF ANGIOSPERMS (PAPER II) (BOT-302)

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 03

COURSE PLAN

SEM III Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEPTEMBER	UNIT I **Angiosperm taxonomy:** Brief history, Aims and fundamental concepts (alpha taxonomy, omega taxonomy, holotaxonomy), Taxonomic literature, Herbarium technique, Important herbaria and Botanical gardens of India	Definition of taxonomy, fundamental rules and types of taxonomy,Taxonomic tools, Herbaria and botanical garden of india	PPT cum lecture method , Group discussion, Online Quiz	Understand the basic aspects of plant taxonomy and botanical nomenclature	*Knowledge Based* -Define omega taxonomy -Difference between holotype and neotype *Understanding Based* -Illustrate concept of numerical taxonomy and its merits -Campare of Floral characters of Malvaceae family with Apocynaceae	Knowledge--50 Understanding-35 Higher Order-15
	Botanical nomenclature: Principal and rules, Salient features of International Code of Botanical Nomenclature, Taxonomic ranks, Type concept, Principle of priority.	Definition of Nomenclature, rules of ICBN ,Typhification method, POR concept	PPT cum lecture method			

	Major contribution of cytology, Phytochemistry and Taximetrics to taxonomy	Role of plant taxonomy in cytology ,phytochemistry ,Numerical taxonomy			*Higher Order Thinking Skills Based* -Discuss difference between Bentham and Hooker and Engler and Prantl system of classification – - Elaborate taxonomic features of Euphorbiaceae family and compare it with Asteraceae	
OCTOBER	UNIT II **Classification of Angiosperms:** Salient features of systems proposed by Bentham & Hooker, Engler&Prantl	Classificationused for angiospermic plants given by B&H and E&P Difference and merit and demerits of B&H and E&P system of classification.	PPT Cum Lecture, Assignment, Group discussion	Compare various plant families and classify plants on the basis of their characters		
NOVEMBER	**Diversity of flowering plants as illustrated by members of families:** Ranunculaceae, Cruciferae,	Terminology used to describe angiospermic plants, Description of Ranunculaceae, Cruciferae with help of vegetative characters and their floral diagrams and floral formula	Videos, PPT cum lecture method,			

	Diversity of flowering plants as illustrated by members of families:, Malvaceae, Rutaceae, Fabaceae, Apiaceae, and Compositae	Terminology used to describe angiospermic plants, Description of Malvaceae, Rutaceae, Fabaceae, Apiaceae, and Compositae with help of vegetative characters and their floral diagrams and floral formula	PPT cum lecture method Diagrams, Student presentation			
DECEMBER	UNIT III **Diversity of flowering plants as illustrated by members of families:** Acanthaceae, Apocyanaceae,	Description of Acanthaceae, Apocyanaceae, with help of vegetative characters and their floral diagrams and floral formula ,	PPT cum lecture method Diagrams, Assignment	Appreciate the diversity of flowering plants		
JANUARY	**Diversity of flowering plants as illustrated by members of families:** Asclepiadaceae, Solanaceae, Labiatae,	Description of, Asclepiadaceae, Solanaceae, Labiatae,with help of vegetative characters and their floral diagrams and floral formula	PPT cum lecture method Diagrams, Assignment, online quiz			
FEBRUARY	**Diversity of flowering plants as illustrated by members of families:**Euphorbiaceae, Liliaceae and Poaceae. Covid	Description of, Description of Acanthaceae, Apocyanaceae, with help of vegetative characters and their	PPT cum lecture method Diagrams, Online Videos Class test (Google form)			

	19: Role of plants in developing immunity (Ginger, Turmeric, Clove, Giloy)	floral diagrams and floral formula with help of vegetative characters and their floral diagrams and floral formula . Chemical Composition of mentioned medicinal plants for treatment of Covid 19.				

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B.Sc. III (SEMESTER V)

DEVELOPMENT AND UTILIZATION OF PLANTS (PAPER II) (BOT-502)

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 03

COURSE PLAN

SEM V Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEPTEMBER	UNIT I **Growth and development:** Definitions, Phases of growth and development, Growth kinetics	Definition of Growth and Developmet ,Phases and kinetics of growth ,.	PPT cum lecture method. Online videos	Understand the process of growth and development and the phenomena of flowering	*Knowledge Based* -Define term vernalization -Infer concept of floreign harmone. *Understanding Based* Illustrate concept of phytochrome and write about functional roles of its forms. *Higher Order Thinking Skills Based* -Discuss about the discovery of gibberellins and its physiological role -Explain Morphogical structure of any two fibre plants and write its economic value	Knowledge--40 Understanding-40 Higher Order-20
	Photoperiodism: Florigen concept. Vernalization	Flowering Harmone and Vernalization	PPT cum lecture method, Diagrams			
SEPTEMBER	**Photomorphogenesis:** Phytochrome- discovery, Physiological role. Mechanism of action, HIR (High Irradiance Response)	Phytochrome and its physiological effects,HIR	Diagrams, PPT cum lecture method			
	UNIT II **Plant hormones:** Discovery, Structure, Bioassay, Physiological role and Application of; Auxin, Gibberellin,	Definition of Plant harmones, History ,Structure, Bioassay and physiological rloe of Auxin and	PPT cum lecture method, Online Quiz , Online Videos, Presentation by	Assess the		

		Gibberellin.	Students	role of various plant hormones in regulating vital functions in plants	- Discuss about the processing of tea	
OCTOBER	**Plant hormones:** Discovery, Structure, Bioassay, Physiological role and Application of; Cytokinin, Abscisic acid and Ethylene	Defination of Plant harmones, History ,Structure, Bioassay and physiological rloe of Cytokinin, Abscisic acid and Ethylene				
OCTOBER-NOVEMBER	UNIT III **Utilization of Plants: Food Plants:** Rice, Wheat, Maize, Sugarcane **Fibers:** Cotton and Jute	Defination of Economic botany, Family ,Scientific ,part used ,Morphological ,Cultivation and uses of Food plants and fibre plants	PPT cum lecture method, Online test (Google form)	Appraise and prioritize the utility of plant species		
DECEMBER-JANUARY	**Vegetable oils:** Groundnut, Mustard and Coconut **Spices:** General account (Black pepper, Cloves, Cinnamon, Cardamom, Turmeric, Coriander)	Family ,Scientific ,part used ,Morphological ,Cultivation and uses of vegetable oils and spices and condiments.	PPT cum lecture method, Assignment, Group Discussion .			
FEBRUARY	**Medicinal Plants:** General account (Atropa, Serpentine, Brahmi, Ashwagandha) **Beverages:** Tea and Coffee **Rubber**Role of plants in developing immunity against covid	Family ,Scientific ,part used ,Morphological ,Cultivation ,chemical composition and uses of medicinal plants , beverages and rubber.	PPT cum lecture method, Presentation by students, Online Videos			

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B.Sc. I (SEMESTER II)

BRYOPHYTES AND PTERIDOPHYTES (PAPER II) (BOT 201)

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 03

COURSE PLAN

SEM II Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
APRIL	UNIT I **Bryophytes-** General characters, Classification, Economic and Ecological importance.	General characters of bryophytes, Important characters of different classes of bryophytes ,economic importance of bryophytes	PPT cum lecture method, Assignment, Online videos.	Assess the role of bryophytes as pioneers in plant communities	*Knowledge Based* -Which stage is dominant in Bryophytes? -Discuss about the characteristics of different classes of Bryophytes. *Understanding Based* -Illustrate thallus organisation of different division of Bryophytes with help of diagrams and examples. -Infer about the stellar system in pteridophytes with help of diagrams and examples. *Higher Order Thinking Skills Based* -Explain homosporous	Knowledge--60 Understanding-30 Higher Order-10
MAY	**Hepaticopsida-** *Marchantia***Anthocerotopsida-** *Anthoceros*	General characteristics of Hepaticopsida and Anthocerotopsida ,Thallus organisation ,Asexual and sexual reproduction of *Marchantia, Anthoceros*	PPT cum lecture method, Diagrams, Group Discussion			
	Bryopsida- *Funaria*	General characteristics of Bryopsida ,Thallus organisation ,Asexual and sexual rep. of *Funaria*	PPT cum lecture method, Online test (Google form)			
MAY	UNIT II **Pteridophytes-** General characters, Classification, Stelar system.	General characters of Pteridophytes , classification and general characters of different classes of pteridophytes ,Types of stelar system in Pteridophytes	PPT cum lecture method, Presentation by Students, Online Quiz, Online videos	Categorize major groups of pteridophytes		

					pteridophyte prothallus with that of homosporous Pteridophytes. -Compare Sexual mode of reproduction of *Selaginella* with *Equisetum.* with help of diagrams.	
JUNE	**Important characteristics of:** Psilophyta, Lycophyta, Sphenophyta.	Recall characteristics of Psilophyta , Lycophyta, Sphenophyta and explain with help of examples.	PPT cum lecture method			
	Important characteristics of: Pterophyta.	Recall characteristics of Pterophyta explain with help of examples.	PPT cum lecture method			
JUNE-JULY	UNIT III **Structure and reproduction in:** *Rhynia, Lycopodium*	Characteristics of fossil plants , Desciption of *Rhynia* (fossil pteridophyte) Morphology ,sexual and asexual reproduction of *Lycopodium*	PPT cum lecture method , Assignments, Online Videos, Diagrams	Compare the structure and reproduction in various genera of pteridophytes		
	Structure and reproduction in*Selaginella, Equisetum, Pteris* and *Marsilea*	Morphology ,sexual and asexual reproduction of *Selaginella, Equisetum, Pteris* and *Marsilea*	PPT cum lecture method, Assignments, Online Test (Google Form)			

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B.Sc. II (SEMESTER IV)

DIVERSITY OF SEED PLANTS (PAPER II) (BOT-401)

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 03

COURSE PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
JANUARY	UNIT I **Characteristics of seed plants:** Evolution of seed habit, Seed plants with fruits (Angiosperms) and without fruit (Gymnosperms).	Characteristics of angiosperms and gymnosperms, Concept of seed habit ,evidences to prove seed habit	PPT cum lecture method ,	Understand evolution of seed habit with some examples of primitive angiosperms	*Knowledge Based* -What is seed plants? -Dicuss about paleobotanical evidences of seed habit with help of examples. *Understanding Based* - Illustrate primitive characters of *Trochodendron* and compare it with *Driyms.* - Discuss in detail about the primitive characters of *Cycadeoidea*	Knowledge--50 Understanding-35 Higher Order-15
	Angiosperms: Origin and Evolution, Some examples of primitive Angiosperms (*Magnolia, Degenaria,*	Origin of seed plants ,characteristics of primitive angiosperms Morphology and reproductive structure of *Magnolia, Degenaria,*	PPT cum lecture method, Diagrams ,			
	Some examples of primitive Angiosperms *Trochodendron, Driyms*	Morphology and reproductive structure of *Trochodendron, Driyms*	PPT cum lecture method, Group discussion, Diagrams			
FEBRUARY-MARCH	UNIT II **Gymnosperms:** General characteristics, Classification, Geological time scale	Characteristics of Gymnosperms Classification ,Discussion on periods and era	PPT cum lecture method, Presentation by students, Online quiz	Infer the process of fossilization and focus on fossil gymnosperms		
	Fossilisation and some examples	Types of fossils and	PPT cum lecture			

	of fossil gymnosperms *Lyginopteris, Glossopteris,*	methods of studying fossils.	method, Online videos			
	Examples of fossil gymnosperms *Ptilophyllum, Williamsonia, Cycadeoidea*	Characters of fossil gymnosperms and morphology and reproductive structure of some fossil gymnosperms.	Diagrams		*Higher Order Thinking Skills Based* -Describe sexual reproduction of *Ephedra* and campare with reproduction in *Cycas* emphasized main on Gametophytic generation	
APRIL-MAY	**Morphology of vegetative & reproductive parts and Anatomy of:** root, stem and leaf, reproductive parts and life cycle *of Cycas,*	Morphology,anatomical and reproductive structure and life cycle of *cycas*	PPT cum lecture method, Diagrams, Online test (Google form), Online videos	Illustrate distribution, morphology, anatomy and reproductive biology of gymnosperms		
JUNE	**Morphology of vegetative & reproductive parts and Anatomy of:** root, stem and leaf, reproductive parts and life cycle *of, Pinus*	Morphology,anatomical and reproductive structure and life cycle of *Pinus*	PPT cum lecture method, Diagrams, Assignments			
JULY	**Morphology of vegetative & reproductive parts and Anatomy of:** root, stem and leaf, reproductive parts and life cycle *of Ephedra*	Morphology,anatomical and reproductive structure and life cycle of *Ephedra*	PPT cum lecture method, Diagrams, Assignments			

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B.Sc. III (SEMESTER VI)

PLANT ECOLOGY (PAPER I) (BOT-601)

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 03

COURSE PLAN

SEM VI Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
JANUARY	UNIT I **Environment:** Atmosphere (gaseous composition), Water (properties of water cycle), Light (global radiation and photosynthetically active radiation),	Terminology in ecology, Atmosphere and layers of atmosphere , Properties of water and hydrological cycle ,Light and importance of light.	PPT cum lecture method, Diagrams, Assignments, Online videos.	Consider that how the Ecological systems function	*Knowledge Based* -Define ecology. - Recall about atmosphere layer. *Understanding Based* -Discuss about the morphological and physiological characters of hydrophytes and campare it with xerophytes. -Elaborate analytical and synthetic characters of community with help of example. *Higher Order Thinking Skills Based*	Knowledge--40 Understanding-40 Higher Order-20
	Temperature, Soil (development, soil profiles, physico-chemical properties)	Temperature and importance of light,soil profile and properties of soil.	PPT cum lecture method, Diagrams, Assignments			
FEBRUARY	UNIT II **Morphological, anatomical and physiological adaptations of plants to**	Morphological ,anatomical and physiological characteristics of hydrophytes,	PPT cum lecture method, Diagrams, Assignments , Group discussion	Understand how food webs and trophic level work		

	water: hydrophytes, xerophytes and halophytes	xerophytes and halophytes			-Discuss about the functional ascepts of ecosystem with help of examples and diagrams. -.Relate hydrosere succession with Xerosere succession and elaborate answer with help of ray diagrams.	
	Population ecology: Growth curves, Ecotypes, Ecads. Types of species Interaction.	Gene Ecology, Population ecology Negative and positive interaction	PPT cum lecture method, Diagrams, Online videos, Online test (Google form)			
MARCH	**Community ecology:** Characteristics, Characters (analytical and synthetic), Biological spectrum, Ecological succession, concept of climax, Ecological niche	Analytical and synthetic characters of community Ecological succession and its type Ecological niche and its type	PPT cum lecture method, Diagrams, Presentation by students			
APRIL –MAY	UNIT III **Ecosystems:** Structure- abiotic and biotic components, food chain, food web, ecological pyramids, energy flow	Defination of Ecosystem and its components Functional aspect of ecosystem	PPT cum lecture method, Diagrams, Assignments, Online videos	Assess the relationship between organisms and their environment		
JUNE	**Biogeochemical cycles** of- carbon, nitrogen and phosphorous	Ecological cycles, C,N and P cycles and their role in ecosystem	PPT cum lecture method, Diagrams, Presentation by students			
	Biogeographical regions of India.Vegetation types of India: Forests and grassland	Forests and grassland and vegetation of India	PPT cum lecture method, Assignments			

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B.Sc. III (SEMESTER VI)

BOT 602(b): BIODIVERSITY AND PLANT CONSERVATION

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credit: 03

SEM VI Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
DECEMBER	UNIT I **Biodiversity**: Definition and types (Genetic diversity, Species diversity and Ecosystem diversity),	Definition of Biodiversity, Types of Biodiversity , Levels of Biodiversity	PPT cum lecture method, lecture method Diagrams,	Consider that how the Ecological systems function	*Knowledge Based* -Define Biodiversity -Infer about Ecosystem diversity. *Understanding Based* -Discuss about threats to biodiversity- Eluicidate about direct and indirect value of Biodiversity	Knowledge--40 Understanding-40 Higher Order-20
JANUARY	Agrobiodiversity, Hot spots, Threats, Values; Ethical, aesthetic values and social values	Definition of Hotspots, Direct and Indirect values of Biodiversity	PPT cum lecture method, Lecture method, group Discussion, Quiz			
	Loss of Biodiversity: Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agrobiodiversity	Threats to Biodiversity, Types of loss of Biodiversity	PPT cum lecture method, lecture method Diagrams,			
JANUARY/ FEBRUARY	UNIT II **Environmental pollution:** Air, water and land pollution;	Types of Pollutions, Causes of Pollution and Negative Impacts of	PPT cum lecture method, Diagrams,	Identify the causes, effects and strategies to		

	sources, effects on plants and ecosystem, ,	Pollution	Quiz,Assignments and Class Tests	combat environmental pollution	*Higher Order Thinking Skills Based* -Discuss about in-situ and ex-situ conservation. -Explain about the different institutions related to plant conservation.	
	Control measures, Plants as pollution indicators	Methods to control pollution	PPT cum lecture method, lecture method, Diagrams, Assignment, Quiz and Class tests			
MARCH	UNIT III **Conservation**: Conservation of Endangered and Endemic plants, Red Data Book, afforestation	Definition of Sustainable development, Endangered and endemic sp, Red Data Book and List of Endangered fauna and flora.	PPT cum lecture method, Diagrams, Presentation by students	Reflect upon the different National conservation and International efforts for biodiversity		
MARCH/ APRIL	***In-situ* conservation-** Biosphere Reserves, National Parks and sanctuaries, Sacred Groves ***Ex-situ* conservation**: Botanical Gardens, Gene Banks, Plant tissue culture, Cryopreservation	Ecological cycles, C,N and P cycles and their role in ecosystem	PPT cum lecture method, Diagrams, lecture method			
APRIL	Elementary knowledge of institutions related to plant conservation: Botanical Survey of India (BSI), National	Forests and grassland and vegetation of India	PPT cum lecture method, Assignments			

	Bureau of Plant Genetic Resources (NBPGR), Council of Scientific and Industrial Research (CSIR), Department of Biotechnology (DBT), Indian Council of Agricultural Research (ICAR), IUCN, UNEP, UNESCO, WWF					

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