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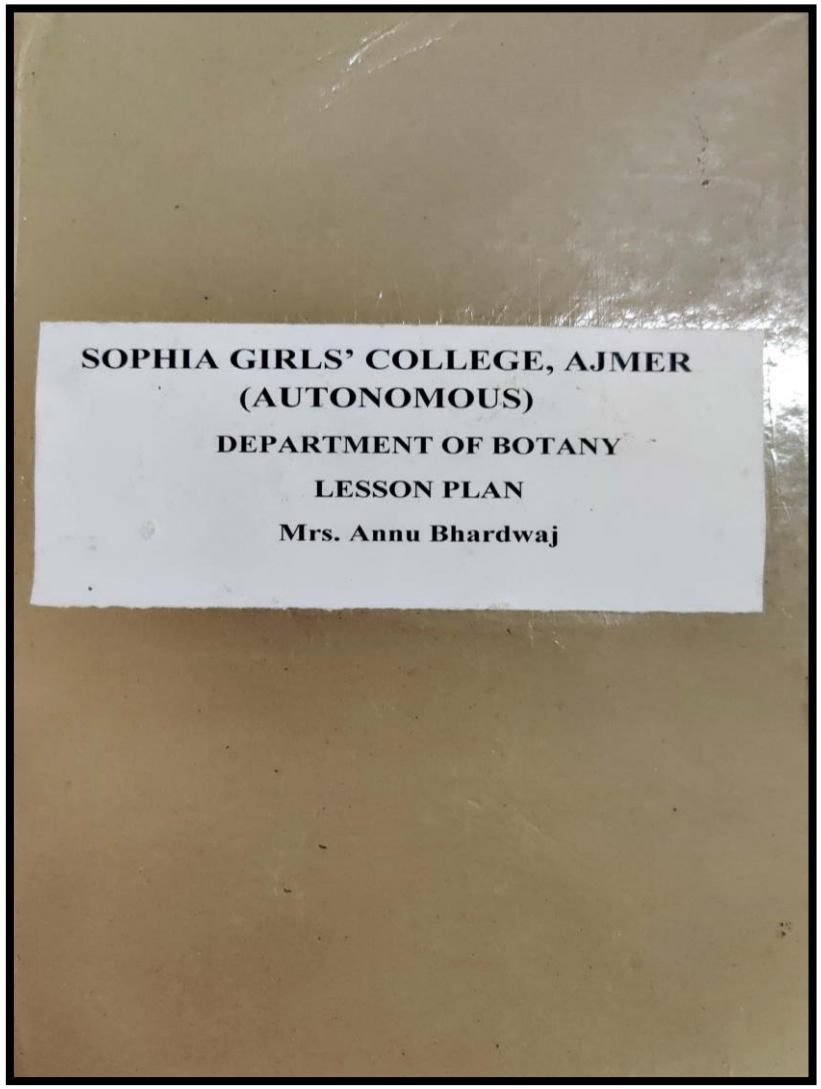

SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)

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 (%)
JULY	**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	Lecture Group discussion	Categorize organisms as algae, fungi and lichens	*Knowledge Based* -What is algae and how it is differ from fungi? Write general characters of cyanophyceae. *Understanding Based* Elaborate the life cycle of *Polysiphonia* with the help of ray diagram. _Describe thallus organisation, pigments and reserve food in different classes of algae *Higher Order Thinking Skills Based* Describe	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 with examples	PPT, Lecture, Diagrams, Assignments			
	A General account of lichens	General characters of lichens and three types of lichens and their morphology.	Lecture, PPT			
AUGUST	**UNIT II** **Important features and life history of:** Cyanophyceae-	Characteristics of classes of algae and thallus structure and mode of reproduction in	Diagrams, Pictures, Lecture	Appreciate the diversity of life forms		

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	Nostoc, Oscillatoria	different genus of algae			hetrothallism in fungi with help of examples. -Compare the life cycle of *Puccinia* with *Aspergillus*	
	Chlorophyceae- *Volvox, Oedogonium*	Thallus organisation and life history of some members of chlorophyceae	Diagrams, Slide preparation Lecture			
	Xanthophyceae- *Vaucheria* Phaeophyceae- *Ectocarpus* Rhodophyceae- *Polysiphonia*	Thallus organisation and life history of members of Xanthophyceae, Phaeophyceae and Rhodophyceae	Diagrams, Pictures, Specimens, Slide preparation, Lecture			
SEPTEMBER-OCTOBER	**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	Pictures, Specimens, Lecture	Understand phylogenetic relationship, ecology and economic importance of algae, fungi and lichens		
	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, Pictures, Specimens,Slide preparation Lecture			

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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 (%)
SEM III JULY	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	Diagrams, Demonstration, Lecture, Quiz Herbarium preparation ,Campus survey	Understand the basic aspects of plant taxonomy and botanical nomenclature	*Knowledge Based* -What is a omega taxonomy? -Discuss about ICBN *Understanding Based* Compare Botanical characters of Apocynaceae with Malvaceae family. Illustrate taxonomic characters Rananculaceae *Higher Order Thinking Skills Based*	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	Lecture, Group discussion			
	Major contribution of cytology, Phytochemistry and Taximetrics to taxonomy	Role of plant taxonomy in cytology ,phytochemistry ,Numerical taxonomy	Lecture, Assignment Group discussion			

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					Relate taxonomic characters of monocot families studied by you - -With a help of floral diagram and floral formula campare Euphorbiaceae family with Liliaceae family.	
AUGUST	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.	Lecture, Assignment,	Compare various plant families and classify plants on the basis of their characters		
	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	Diagrams, Section cutting, Lecture, Campus survey			
	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	Diagrams, Section cutting, Lecture Demonstration , Campus survey			

SEPTEMBER-OCTOBER	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 ,	Diagrams, Section cutting, Lecture,Campus survey, Herbarium preparation	Appreciate the diversity of flowering plants		
	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	Diagrams, Section cutting, Lecture,Campus survey, Herbarium preparation			
NOVEMBER	**Diversity of flowering plants as illustrated by members of families:**Euphorbiaceae, Liliaceae and Poaceae.	Description of, Description of Acanthaceae, Apocyanaceae, with help of vegetative characters and their floral diagrams and floral formula with help of vegetative characters and their floral diagrams and floral formula	Diagrams, Section cutting, Lecture,Campus survey, Herbarium preparation			

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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 (%)
JULY	UNIT I **Growth and development:** Definations, Phases of growth and development, Growth kinetics	Defination of Growth and Developmet ,Phases and kinetics of growth ,.	Lecture, ,Presentation	Understand the process of growth and development and the phenomena of flowering	*Knowledge Based* -What is Development? -Write a note on Kinetics of growth *Understanding Based* -Illustrate concept of Vernalization -Explain bioassay of auxin with help of diagrams *Higher Order Thinking Skills Based* -Explain the physiological role of Gibberellin and cytokinin	Knowledge--40 Understanding-40 Higher Order-20
	Photoperiodism: Florigen concept. Vernalization	Flowering Harmone and Vernalization	Diagrams, Lecture Presentation			
	Photomorphogenesis: Phytochrome- discovery, Physiological role, Mechanism of action, HIR (High Irradiance Response)	Phytochrome and its physiological effects,HIR	Lecture, Demonstration			
AUGUST	UNIT II **Plant hormones:** Discovery, Structure, Bioassay, Physiological role and Application of; Auxin, Gibberellin,	Defination of Plant harmones, History ,Structure, Bioassay and physiological rloe of Auxin and Gibberellin.	Lecture, Presentation Group Discussion	Assess the role of various plant hormones in regulating vital		

	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	Lecture, Group Discussion Diagrams	functions in plants		
SEPTEMBER-OCTOBER	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	Lecture, Presentation Assignment	Appraise and prioritize the utility of plant species		
NOVEMBER	**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.	Lecture, Presentation			
	Medicinal Plants: General account (Atropa, Serpentine, Brahmi, Ashwagandha) **Beverages:** Tea and Coffee **Rubber**	Family ,Scientific ,part used ,Morphological ,Cultivation ,chemical composition and uses of medicinal plants , beverages and rubber.	Lecture, Presentation Group Discussion			

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B.Sc. I (SEMESTER II)

BRYOHYTES 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 (%)
DEC	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	Group discussion, Lecture, Presentation	Asses the role of bryophytes as pioneers in plant communities	*Knowledge Based* -Which group of plant kingdom known as amphibians of plant kingdom? -Write important characteristics of Hepaticopsida Why pteridophytes are known as reptiles of plant kingdom *Understanding Based* -Campare ganmetophytic structure of *Marchantia* with *Anthoceros* -Discuss about stellar system and modification of siphnostele *Higher Order Thinking Skills Based*	Knowledge--60 Understanding-30 Higher Order-10
	Hepaticopsida- *Marchantia***Anthocerotopsida-** *Anthoceros*	General characteristics of Hepaticopsida and Anthocerotopsida ,Thallus organisation ,Asexual and sexual reproduction of *Marchantia, Anthoceros*	Lecture, Diagrams, Presentation			
	Bryopsida- *Funaria*	General characteristics of Bryopsida ,Thallus organisation ,Asexual and sexual rep. of *Funaria*	Group discussion, Lecture			
JAN	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	Diagrams, Pictures, Lecture Presentation	Categorize major groups of pteridophytes		

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					-Recall Important characteristic of different divisions of pteridophytes help of examples. -Compare Sexual reproduction of *Selaginella* with *Equisetum*.	
	Important characteristics of: Psilophyta, Lycophyta, Sphenophyta.	Recall characteristics of Psilophyta , Lycophyta, Sphenophyta and explain with help of examples.	Diagrams, Pictures, Lecture,Charts,			
	Important characteristics of: Pterophyta.	Recall characteristics of Pterophyta explain with help of examples.	Diagrams, Lecture			
FEB- MAR	UNIT III **Structure and reproduction in:** *Rhynia, Lycopodium*	Characteristics of fossil plants-, Desciption of *Rhynia* (fossil pteridophyte) Morphology ,sexual and asexual reproduction of *Lycopodium*	Diagrams, Specimens, Lecture Slide preparation	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*	Diagrams, Pictures, Specimens, Lecture, Slide preparation			

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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 (%)
SEM III DEC	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	Diagrams, Demonstration, Lecture, Quiz	Understand evolution of seed habit with some examples of primitive angiosperms	*Knowledge Based* -Definition of seed habit? -Explain paleobotanical evidences to support hetrospory. *Understanding Based* - Write the characteristics of primitive angiosperms of with help of examples? - Differentiate fossil characters of *Trochodendron,* with *Magnolia,* *Higher Order Thinking Skills Based* -Explain	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,*	Lecture and presentation			
	Some examples of primitive Angiosperms *Trochodendron, Driyms*	Morphology and reproductive structure of *Trochodendron, Driyms*	Lecture, Assignment, Charts			
JAN	UNIT II **Gymnosperms:** General characteristics, Classification, Geological time scale	Characteristics of Gymnosperms Classification ,Discussion on periods and era	Lecture, Group discussion , Presentation	Infer the process of fossilization and focus on fossil gymnosperms		
	Fossilisation and some examples of fossil gymnosperms *Lyginopteris, Glossopteris,*	Types of fossils and methods of studying fossils.	Lecture, Presentation			
	Examples of fossil gymnosperms	Characters of fossil	Lecture,			

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	Ptilophyllum, Williamsonia, Cycadeoidea	gymnosperms and morphology and reproductive structure of some fossil gymnosperms.	diagrams, Presentation		Morphological characters of Pinus and campare with *Ephedra*	
FEB-MAR	**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*	Lecture ,Practical,slide preparation ,presentation	Illustrate distribution, morphology, anatomy and reproductive biology of gymnosperms		
	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*	Lecture ,Practical,slide preparation			
	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*	Lecture ,Practical,slide preparation ,presentation			

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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 (%)
DEC	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.	Diagrams, Lecture, Assignment	Consider that how the Ecological systems function	*Knowledge Based* -What is a ecosystem? -Illustrate layers of atmsphere *Understanding Based* -Recall soil profile and properties of soil. -Differentiate Analytical and Synthetic characters of community . *Higher Order Thinking Skills Based* -Explain gene ecology.	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.	Diagrams, Lecture Assignment.			
JAN	UNIT II **Morphological, anatomical and physiological adaptations of plants to water:** hydrophytes,	Morphological ,anatomical and physiological characteristics of hydrophytes, xerophytes and	Diagrams, Lecture Slide preparation	Understand how food webs and trophic levels work		

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	xerophytes and halophytes	halophytes			- Describe phosphorus cycle with help of ray diagram.	
	Population ecology: Growth curves, Ecotypes, Ecads. Types of species Interaction.	Gene Ecology, Population ecology Negative and positive interaction	Diagrams, Lecture Presentation			
	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	Diagrams, Lecture Presentation			
FEB-MAR	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	Diagrams, Lecture Presentation	Assess the relationship between organisms and their environment		
	Biogeochemical cycles of- carbon, nitrogen and phosphorous	Ecological cycles, C,N and P cycles and their role in ecosystem	Diagrams, Lecture Presentation			
	Biogeographical regions of India.Vegetation types of India: Forests and grassland	Forests and grassland and vegetation of India	Diagrams, Lecture			

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