

SARDAR PATEL UNIVERSITY
Programme: MSC (Integrated Biotechnology)
Semester: I
Syllabus with effect from: June 2010

Paper Code: PS01CIGB05	Total Credits: 3
Title Of Paper: Plant Sciences	

Unit	Description in detail	Weightage (%)
1	<p>Cryptogams: Eichler's system of Classification. Algae: Introduction, Distribution and habitat, Morphology, Reproduction and Life Cycle of Spirogyra and Economic importance of Algae. Fungi: Introduction, Distribution and habitat, Morphology, Reproduction and Life cycle in Mucor. Lichens: Introduction and General account of Lichens. Bryophyta: Introduction, Distribution and habitat, Morphology, Reproduction and Life cycle in Riccia. Pteridophyta: Introduction, Distribution and habitat, Morphology, Reproduction and Life Cycle in Fern.</p>	
2	<p>Phanerogams: Gymnosperms: Introduction, Distribution and habitat, Morphology, Reproduction and Life cycle in Cycas. Introduction, Classification (Bentham & Hooker), Morphology and Life Cycle of Maize and Sunflower. Study of the families and their Economic importance: Malvaceae, Cucurbitaceae, Solanaceae and Apocynaceae. Medicinal Plants: Ocimum sanctum, Adhatoda vasica, Azadirachta indica, Calotropis procera, and Withania somnifera.</p>	
3	<p>Reproduction in plants: Asexual reproduction: Natural vegetative reproduction (bulb, corm, rhizome, stolon, offset, runner, tuber), Advantages and Disadvantages of natural asexual reproduction. Artificial propagation: Cutting, Layering, Grafting and Budding. Sexual reproduction: Microsporogenesis and Microgametogenesis, types of ovules, Megasporogenesis and Megagametogenesis, Structure of embryo sac, Pollination types of pollination, Pollen-Pistil interaction, Self incompatibility, Double fertilization, Post-fertilization changes in the ovule, Development of embryo and endosperm, types of endosperm and Seed formation.</p>	
4	<p>Plant Anatomy and Genetics: Meristem – type and its role in Primary growth. Permanent tissues – Simple tissues (Parenchyma, Collenchyma and Sclerenchyma) and Complex tissues (Xylem and Phloem). Types of Vascular Bundles and stele. Internal Structure of root and stem of Maize and Sunflower. Anamalous Secondary growth in Boerhaavia and Dracaena. Mendal's laws of inheritance (law of segregation, law of dominance and law of independent assortment). Dihybrid cross, Back cross and Test cross, Incomplete dominance. Gene interaction: Dominant epistasis (12:3:1), Recessive epistasis (9:3:4) and Complementary gene (9:7).</p>	
	Practical:	



	<ul style="list-style-type: none"> • Study of algae and fungi – Spirogyra , Mucor (Mounting). • Lichen: Study of lichens: (i) Foliose, Fruticose, Crustose(specimens). • (ii) V.S. of apothecium (Permanent slide). • (iii) Sporophyte of Riccia. • Study of Life history of Riccia: (i) T.S. of thallus (Permanent slide). <li style="padding-left: 40px;">(ii) Structure of antheridia (Permanent slide). <li style="padding-left: 40px;">(iii) Structure of Archegonia (Permanent slide). • Study of life history of fern: (i).Morphology of the plant. <li style="padding-left: 40px;">(ii). T.S. of rachis (Sectioning). <li style="padding-left: 40px;">(iii). Mounting of sporangia. • Study of life history of Cycas : (i). T.S. of leaflet (Sectioning). <li style="padding-left: 40px;">(ii). Mounting of pollen grains. <li style="padding-left: 40px;">(iii). Megasporophyll & Male cone. <li style="padding-left: 40px;">(iv). T.S. of Ovule (Permanent slide). • Study of the families – Malvaceae & Cucurbitaceae. • Study of the families – Solanaceae & Apocynaceae. • Study of the medicinal plants (As per the theory). • Study of vegetative reproduction - bulb, corm, rhizome, stolon, offset runner and tuber. • Study of Grafting techniques. • Study of ovules with the help of Chart \ Permanent slides. • Study of simple tissues and permanent tissue (Permanent slides and Fresh sections). • Types of Vascular bundle and stele (Permanent slides \ Charts). • Study of anatomy of stem - Maize and Sunflower (Sectioning). • Study of anatomy of root - Maize and Sunflower (Sectioning). • Study of T.S of Boerhaavia and Dracaena (Permanent slides and sectioning). • Study of Genetics Problems. • Visit to a Medicinal Plants Unit. 	
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Basic Text & Reference Books:

- Botany for degree students by A. C. Dutta,(18th Ed. 2005), Oxford University Press. ISBN: 13:978-0-19-563748-9, ISBN: 10:0-19-563748-8.
- University Botany-I, Algae, Fungi, Bryophyta and Pteridophyta by S. M. Reddy, Publishers: New Age International (P) Limited, Mumbai. ISBN: 81-224-0840-0.
- University Botany- II- Gymnosperm, Angiosperms by S. M. Reddy, Publishers: New Age International (P) Limited, Mumbai.
- Taxonomy of Angiosperms by Dr. A. V. S. S. Sambamurty. IK International (P) Ltd, New Delhi. ISBN: 81-88237-16-7
- Algae by B. R. Vashishita, Publishers: Chand (S.) and Co. Ltd, New Delhi.
- ISBN: 81-219-0827-2
- Fungi by B. R. Vashishita. Chand (S.) and Co. Ltd, New Delhi. ISBN: 81-219-0171-5
- Botany for degree students Part –III: Bryophyta by B. R. Vashishita. Chand (S.) and Co. Ltd, New Delhi. ISBN-10: 8121901723, ISBN: 13-978-8121901727
- Bryophyta by Prem Puri. Publisher: Athmaram and Sons.
- An introduction to Bryophyta by N.S. Parihar. Central Book Depot, Alahadbad. ISBN: 3-443-62006-X
- Botany for degree students Part –III: Pteridophyta by B. R. Vashishita. Chand (S.) and Co. Ltd, New Delhi. ISBN-10: 81-219-0003-4

