Govt. College, Ropar
Department of Botany
Syllabus Plan
Session: - 2019-2020 (Semester 3)

Month	Paper 5 DIVERSITY AND SYSTEMATICS OF GYMNOSPERMS	Paper 6 DIVERSITY AND SYSTEMATICS OF ANGIOSPERMS	PRACTICALS
JULY 3rd week 4th week	• General features of gymnosperms and their classification; evolution and diversityof gymnosperms • Geological time scale, fossilization and fossil gymnosperms.Distribution, Cytologyand Economic Importance of Indian Gymnosperms.	• Origin and evolution of Angiosperms- giving suitable examples.Primitive and advanced characters of Angiosperms. • Angiosperm taxonomy; brief history,aims and fundamental components	• The following genera are recommended for study. • **Ranunculaceae**: *Ranunculus, Delphinium.* • **Brassicaceae**: *Brassica, Iberis.* • **Malvaceae**: *Hibiscus, Abutilon.* • **Rutaceae**: *Murraya, Citrus.* • **Fabaceae**: Faboideae: *Lathyrus, Trigonella;* • Caesalpiniodeae: Cassia; Mimosoideae: Acacia, Albizzia.
AUGUST 1st week 2nd week 3rd week	• General characters of Pro-Gymnosperms, morphologicalfeatures of • *Arachaeopteris* and *Aneurophyton;* • origin and evolution of seed habit • General characters of **Cycadales**. Morphology, anatomy, reproduction and life cycle of *Cycas* • **#TEST**	• Different types of taxonomy (alpha-Taxonomy, beta-taxonomy and omega-taxonomy); identification keys. • International code of Botanicalnomenclature. • **#TEST** • Principles and rules; taxonomic ranks; type concept	• Cycas • Study of microsporophyll, megasporophyll and mature seed. • Study through permanent slides – normal root (T.S.) and ovule (L.S.) • Study through hand sections– coralloid root (T.S.). rachis (T.S.),leaflet (V.S.), pollen grains (W.M.)Pinus • Long and dwarf shoot, male andfemale cones, winged seeds. • Study through permanent slides – root (T.S.), Male cone (L.S.), female cone (L.S.), ovule

4th week	• General characters of **Coniferales**. Morphology, anatomy,reproduction and life cycle of *Pinus*	• Classification of angiosperms, salientfeatures of the systems proposed by Bentham and Hooker	(L.S.), embryo (W.M.) showingpolycotyledonous condition. • Study through hand sections and prepration of permanent studies in young stem (T.S.), old stem needle (T.S.), pollen grains (W.M.).
SEPTEMBER 1st week 2nd week 3rd week 4th week	General characters of **Ephedrales** Morphology, anatomyandreproduction and life cycle of *Ephedra* • **#TEST** • **MST**	• Classification of angiosperms; salient features of the systems proposedby Hutchinson and Engler and Prantl. • Diagnostic features and technical description and taxonomic importance of flowering plants as illustrated by membersof families **Ranunculaceae, Brassicaceae, Malvaceae, Rutaceae, Fabaceae**. • **MST**	• **Ephedra** • Structure of male and female cones. • Hand sections – Stem (T.S.), maceration to show vessel structure; pollen grains (W.M. • The following genera arerecommended for study. • **Apicaceae**: *Coriandrum*. • **Cucurbitaceae**: *Cucurbita* • **Rosaceae** :*Rose*
OCTOBER 1stweek 2nd week 3rd week 4th week	• General characters of **Gnetales**. Morphology, anatomy and reproduction and life cycle of*Gnetum* **#TEST**	• Diagnostic features and technical description and taxonomic importance of flowering plants as illustrated by membersof families **Apiaceae, Cucurbitaceae, Rosaceae,Apocynaceae, Asclepiadaceae, Solanaceae, Lamiaceae, Euphorbiaceae, Asteraceae, Lilliaceae and Poaceae.**	• The following genera arerecommended for study. • **Asclepiadaceae**: *Calotropis*. • **Solanaceae**: *Solanum, Withania*. 3.**Euphorbiaceae**: *Euphorbia, Phyllanthus*. • **Asteraceae**: *Helianthus, Ageratum and Sonchus*. • **Lamiaceae**: *Ocimum, Salvia*.
NOVEMBER 1st week 2nd week	• 4.Evolution of gymnosperms • **#TEST**	• **# REVISION OF FAMILIES**	• The following genera are recommended for study • **Liliaceae**:*Asparagus, Allium*. • **Poaceae**: *Avena, Triticum*.

(PROF. MANJIT KAUR MANCHANDA)
Head of Department

Principal
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	oxidation; saturated and unsaturated fatty acids. • **#TEST-REVISION**		chemical tests. • To determine the seed viabilitythrough Triphenyl Tetrazolium chloride and actual germination tests.

(PROF. MANJIT KAUR MANCHANDA)
Head of Department

Principal
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Session: - 2019-2020 (Semester 4)

Month	Paper 7 PLANT ANATOMY	Paper 8 DEVELOPMENT AND REPRODUCTION IN FLOWERING PLANTS	PRACTICALS
January 4th week	• Fundamental: parenchyma, collenchyma, and sclerenchyma; Vascular system.	• Vegetative Reproduction: Applications in floriculture and horticulture	• To study the anatomy of Dicot and Monocot root, stemand leaves from the locally available material.
February 1st week 2nd week 3rd week	• The root system: the root apical meristem and its histological organization; • 1.(d) Anatomical details of Dicotand Monocot roots. • **#TEST**	• Apomixis: a general account • Flower: a modified shoot; structure, development of flower; Inflorescence types;structure of anther and pistil**#TEST** • Male and female gametophytes; types of pollination; • pollen-pistil interaction	• Study of anomalous secondary growth in *Boerhavia, Nyctanthus, Bougainvillea, Mirabilis.* • Nuclear and cellular endosperm. Embryo development in monocots and dicots.(Permanent slides) • Maceration of wood to study different tracheary elements.

March 1st week 2nd week 3rd week 4th week	• The shoot system: The shoot apical meristem and its histological organization. • Anatomical details of Dicot and Monocot stems;Cambium and its functions • **MST** • Secondary growth including anomalous secondary growth of stem	• self Incompa tibility. • Double fertilization And its further explanations. • **MST** • Post fertilization changes,endosperm and embryo development; seed structure, development.	• • Examination of flowers fortheir pollination mechanism(*Salvia, Ficus, Calotropis, Triticum*). • Structure of anther, microsporogenesis (using slides) and pollen grains andpollinia (using whole mounts). • Study of Pollen viability using glycero-acetocarmine. • Structure of ovule and embryo sac. (Permanentslides)
April 1st week 2nd week	• Leaf: Anatomy in Dicots and Monocots and modification withspecial reference to their function. Study of stomataltypes • **#TEST**	• Dormancy and dispersal;fruit development and types. • **#TEST**	• Study of placentation, fruittypes and seed types. • Testing percentage seedviability through tetrazoliumchloride and actual seed germination.

(PROF. MANJIT KAUR MANCHANDA)
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