BHARATHIAR UNIVERSITY, COIMBATORE:641 046
M. Sc. BOTANY DEGREE COURSE *(AFFILIATED COLLEGES)*
(**Restructurized syllabi** with effect from the academic Year 2015-2016)
SCHEME OF EXAMINATIONS – CBCS PATTERN

Sem.	Study Components	Course title	Ins. hrs/ week	Examinations				Credit
				Dur. Hrs.	CIA	Marks	Total Marks	
I	Paper I	Phycology, Mycology, Bacteriology & Lichenology	5	3	25	75	100	4
	Paper II	Bryophytes, Pteridophytes & Gymnosperms	5	3	25	75	100	4
	Paper III	Environmental Botany & Conservation Biology	5	3	25	75	100	4
	Paper IV	Industrial Microbiology	5	3	25	75	100	4
	Paper V	Ethnobotany						
II	Paper VI	Anatomy, Embryology & Tissue Culture	5	3	25	75	100	4
	Paper VII	Genetics, Plant Breeding & Biostatistics						
	Paper VIII	Cell & Molecular Biology	5	3	25	75	100	4
	Paper IX	Seed Technology	5	3	25	75	100	4
	Paper X	Phytopathology	5	3	25	75	100	4
			5	3	25	75	100	4
	Practical - I	(Papers I to V)						
	Practical - II	(Papers VI to X)	5	3	40	60	100	4
			5	3	40	60	100	4
III	Paper XI	Taxonomy & Biosystematics	5	3	25	75	100	4
	Paper XII	Forest Botany	5	3	25	75	100	4
	Paper XIII	Plant Physiology	5	3	25	75	100	4
	Paper XIV	Phytochemistry	5	3	25	75	100	4
	Elective-I	Physiological Embryology of Angiosperms	5	3	25	75	100	4
IV	Paper XV	Biotechnology & Genetic Engineering	5	3	25	75	100	4
	Elective- II	Introduction to Bioinformatics	5	3	25	75	100	4
	Elective- III	Horticulture	5	3	25	75	100	4
	Practical - III	(Papers XI & XII)	5	3	40	60	100	4
	Practical - IV	(Papers XIII, XIV & XV)	5	3	40	60	100	4
	Practical - V	Elective Papers (I, II & III)	5	3	20	30	50	2
		Total					2250	90

Note: The syllabus for the above papers (except Paper VI - Anatomy, Embryology & Tissue Culture and Paper XI - Taxonomy & Biosystematics) be the same as prescribed for the academic year 2014-2015. The syllabus for the Paper VI - Anatomy, Embryology & Tissue Culture and Paper XI - Taxonomy & Biosystematics are furnished below:

SEM.II

Paper VI - ANATOMY, EMBRYOLOGY AND TISSUE CULTURE.

UNIT – I:
Meristems (general account, vascular cambium – origin, types, structure and etiology. Cambium in wound healing, various types of Anomalous secondary thickening (different positions and activity of cambium). Leaf ontogeny of monocots and dicots.

UNIT-II:
Secondary xylem – Ontogeny, structure and function – Diffuse and porous wood growth layers, sap wood and heart wood. Arrangement of vessels in secondary xylem of Dicots. Structure of rays – types and evolution of rays. Dendrochronology – Compression wood and Tension wood. Phylogenetic trends and specialization of Primary xylem and Primary Phloem – nodals types and evolution.

UNIT-III:
Development of anther, physiology and etiology of anther tapetum, pollen wall morphogenesis. Pollen stigma compatibility, Megasporogenesis and female gametophyte, nutrition of the embryosac.

UNIT-IV:
Fertilization, control of fertilization, apomixes, parthenocarpy, etiology and physiology of endosperm Haustoria, Development of dicot and Monocot embryos and classification. Significance of embryology.

UNIT-V:
Choice of explant, inoculation, protoplast culture, somatic hybridization, meristem culture for virus free clones, cryopreservation – tissues culture in plant improvement, Role of growth promoting substances.

PRACTICALS:

1. **Anatomy:** Study of suitable examples to illustrate features in Anatomy theory syllabus, with the help of section, peelings and mace rations. Submission of double stained 5 hand section slides. Micrometry.
2. **Embryology:** stages in the development of microsporangium and male gametophyte. Configuration of ovules, 2,4 nucleate embryosac, mature embryosac. Types of endosperm. Stages in embryogeny globular proembryos. Mature embryos of monocot and dicot. Interpretation of embryological drawings. In vitro pollen germination.
3. **Tissues culture:** Preparation of stock solution, sterilization, inoculation, nutrient media, organ culture, Morphogenesis, Induction of callus, embryoids.

REFERENCES:

1. Eames, A.J and M.C.Daniel 1976. An introduction to plant Anatomy.
2. Elizabeth, G.Cutter 1978. Plant anatomy part I & II ELBS AND Eclivand Arnald Ltd.
3. Esau, K. 1977. Anatomy of seed plants. Willy
4. Esau, k. 1965. Vascular differentiation in plants. Rirehant and Winston. Inc.

5. Fahn, A. 1967. Plant anatomy Channel and Company.
6. Shewin Carlquist 1962. Comparative plant anatomy. Haif, Rein hart and Wonsten. Pandey, B.P. 1978. Plant anatomy Channel and Company.
7. Bhojwani, S.S and Bhatnagar S.P. 1978. The embryology of angiosperms – Vikas – new Delhi.
8. Johansen, D.A. 1950. Plant embryology.
9. Maheswari, P. 1950. Introduction to embryology of angiosperms McGraw Hill.
10. Maheswari, P. 1963. Recent advances in the embryology of Angiosperms.
11. Reinert Bajaj, 1977. Plant cell, Tissue & Organ culture.
12. Krube Jr. P.J. and Jr. M.K. Petterson 1973. Tissue culture methods and application.
13. Thorpe T.A. 1981. Plant tissue culture methods and application in agriculture.
14. Raghavan. V. 1976. Experimental embryogenesis in vascular plants. Academic press London.
15. Pullaiah, T., Naidu, K.C.., Lakshminarayana, K. and Hanumatha Rao, B. 2007. Plant Development. Regency Publictions, New Delhi.
16. Pullaiah, T., Lakshminarayana, K. and Hanumatha Rao, B. 2000. Text Book of Embrylogy of Angiosperms. Regency Publications, New Delhi.

SEM III

Paper XI - TAXONOMY AND BIOSYSTEMATICS

UNIT-I:
A brief historical account of the classification of angiosperms up to the present day. Systems of classification: Detailed study of Bentham and Hooker, Engler and Prantl, Takhtajan, APG III – Merits and demerits. International code of Botanical Nomenclature, Typification, Principles of priority and their limitations, Effective and valid publication, citation, retention, choice and rejection of names.

UNIT-II:
Menispermaceae. Polygalaceae, Caryophyllaceae. Portulacaceae, Oxalidaceae, Tiliaceae. Combretaceae. Onagraceae, Lythraceae, Aizoaceae.

UNIT-III:
Oleaceae, Gentianaceae, Apocynaceae, Boraginaceae, Bignoniaceae, Pedaliaceae, Nyctaginaceae, Chenopodiaceae, Loranthaceae, Commelinaceae, Aroideae, Cyperaceae, Economic importance of families mentioned.

UNIT-IV:
Flora, Monograph, Keys, Botanical gardens. Source of taxonomic information, Anatomy, Embroyology, phyto chemistry, Molecular taxonomy and DNA barcoding.

UNIT-V:

Biosystematic- its aim and scope. Biosystematic categories, Phenotypic plasticity. Turrreson's work. Population concept. Species and genus concepts, Genecology, ecological differentiation, Numerical taxonomy.

PRACTICALS:

Study of the characters of the above mentioned families, Economic importance, Preparation of artificial key and submission of herbarium sheets – 50.

REFERENCES:

1. A classification of flowering plants Vol. I & II Rendle A.R. Cambridge University press.
2. Taxonomy of vascular plants. Lawerance.H.M. Mac Millan & Co.
3. Principles of Numerical Taxonomy. Sokal, S.R and Sneath P.H, N.H Fremen & co.
4. New concepts in flowering plants taxonomy. Heslop. J. Herrison.
5. Plant Taxonomy – Hey wood, V.H. English hand book society
6. Principles and methods of Plant Biosystematics-solbrig. The Mac Millian Company.
7. An introduction to plant Nomenclature. S.S.R. Bennet international Book distribution India.
8. An aid to the International code of Botanical. Hentry A.N. Today & Tomorrow Pvt. Ltd.
9. Principles of angiosperm Taxonomy. Devis & Hey wood Krieger publication Co.
10. Introduction to Principles of Plant Taxonomy Sivarajan Oxford & IBH Pvt. Company.
11. A hand book of field and Herbarium methods Jain S.K. and Rao R.R. Today and Tomorrow Publications.
12. Plant Taxonomy and Biosystematics. Stace Clive. A Edward Arnold.
13. Plant Systematics. Gurucharan Singh. Oxford & IBH Pvt. Company.