

# ADIKAVI NANNAYA UNIVERSITY

## RAJAMAHENDRAVARAM

### CBCS / Semester System

(W.e.f. 2015-16 Admitted Batch)

#### III Semester Syllabus

#### **BOTANY**

#### **PLANT TAXONOMY AND EMBRYOLOGY**

Total hours of teaching 60hrs @ 4 hrs per week

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#### **UNIT – I: INTRODUCTION TO PLANT TAXONOMY (12 hrs)**

1. Fundamental components of taxonomy (identification, nomenclature, classification)
2. Taxonomic resources: Herbarium- functions & important herbaria, Botanical gardens.
3. Botanical Nomenclature - Principles and rules of ICBN (ranks and names; principle of priority, binomial system; type method, author citation, valid-publication).

#### **UNIT – II: CLASSIFICATION (12 hrs)**

1. Types of classification- Artificial, Natural and Phylogenetic.
2. Bentham & Hooker's system of classification- merits and demerits.
3. Engler & Prantle's system of classification- merits and demerits
4. Phylogeny

#### **UNIT –III: SYSTEMATIC TAXONOMY-I (12hrs)**

1. Systematic study and economic importance of the following families:  
Annonaceae, Fabaceae, Rutaceae, Curcubitaceae, and Apiaceae.

#### **UNIT –IV: SYSTEMATIC TAXONOMY-II (12hrs)**

1. Systematic study and economic importance of plants belonging to the following families:  
Asteraceae, Asclepiadaceae, Lamiaceae, Euphorbiaceae, orchidaceae and Poaceae.

#### **UNIT – V: EMBRYOLOGY (12hrs)**

1. Anther structure, microsporogenesis and development of male gametophyte.
2. Ovule structure and types; Megasporogenesis, development of Monosporic, Bisporic and Tetrasporic types (*Peperomia*, *Drusa*, *Adoxa*) of embryo sacs.
3. Pollination and Fertilization (out lines) Endosperm development and types.
4. Development of Dicot and Monocot embryos, Polyembryony.

**Suggested activity:** Collection of locally available plants of medicinal importance, observing pollen grains in honey, Aero palynology-collection of pollen from air using glycerin strips in different seasons.

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**Books for Reference:**

1. Porter, C.L. ( ): Taxonomy of flowering Plants, Eurasia Publishing House, New Delhi.
2. Lawrence, G.H.M. (1953): Taxonomy of Vascular Plants, Oxford & IBH Publishers, New Delhi, Calcutta.
3. Jefferey, C. (1968) : An Introduction to Plant Taxonomy J.A. Churchill, London.
4. Mathur, R.C. (1970): Systematic Botany (Angiosperms) Agra Book Stores – Lucknow, Ajmer, Allahabad, Delhi.
5. Maheswari, P (1963): Recent Advances in the Embryology of Angiosperms (Ed.) International Society of Plant Morphologists – University of Delhi.
6. Swamy. B.G.L. & Krishnamoorthy. K.V. (1980) : From flower to fruit Tata McGraw Hill Publishing Co., Ltd., New Delhi.
7. Maheswari, P. (1985) : An Introduction to the Embryology of Angiosperms Tata McGraw Hill Publishing Co., Ltd., New Delhi.
8. Bhojwani, S.S. & Bhatnagar, S.P. (2000) : The Embryology of Angiosperms (4<sup>th</sup> Edition) Vikas Publishing House (P) Ltd., UBS Publisher's Distributors, New Delhi.

**PRACTICAL SYLLABUS**  
**PLANT TAXONOMY AND EMBRYOLOGY**  
Total hours of laboratory Exercises 30hrs @ 2 per week

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***Suggested Laboratory Exercises:***

1. Systematic study of locally available plants belonging to the families prescribed in theory syllabus.
2. Demonstration of herbarium techniques.
3. Structure of pollen grains using whole mounts (*Catharanthus, Hibiscus, Acacia, Grass*).
4. Demonstration of Pollen viability test using *in- vitro* germination (*Catharanthus*).
5. Study of ovule types and developmental stages of embryo sac using permanent slides /Photographs.
6. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot Embryos using permanent slides / Photographs
7. Isolation and mounting of embryo (using *Symopsis / Senna / Crotalaria*)
8. Field visits .
9. Study of local flora and submission of Field Note Book.