



Master of Science (Botany)
M. Sc Botany Semester II

Course Code	PS02CBOT52	Title of the Course	Plant Systematics
Total Credits of the Course	04	Hours per Week	04

Course Objectives:	<ol style="list-style-type: none">1. To have understanding on the aims and objectives, different components systematics and its relevance in the contemporary period.2. To explore different data sources of systematics.3. To develop clear understanding about phylogeny and phylogenetic systematics, different methods used in different levels of systematic.4. To develop knowledge on naming plants, the principles and rules of plant nomenclature.5. To develop skills of making plant collections and preserving them in suitable forms.6. To realise and appreciate the role of botanic gardens, national and regional centres involved in plant explorations and conservation.
--------------------	---

Course Content		
Unit	Description	Weightage* (%)
1.	Plant Systematics: Concepts, components and methods; relevance of plant systematics. Taxonomic hierarchy; Concept of taxa (family, genus, species) Taxonomic evidence: morphological; palynological; chromosomal and phytochemical data in plant systematics.	25
2.	Classification systems: A brief history of plant classifications from Linneus to APG IV. An overview of the principles, merits and demerits of major classifications systems of flowering plants. Salient features and inter-relationships of major clades of APGIV. Molecular systematics: Concepts and methods, molecular markers, DNA sequence data, DNA barcoding.	25





SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25))
Syllabus with effect from the Academic Year 2021-2022

3.	<p>Plant identification: Different methods of plant identification, taxonomic keys, floras and monographs.</p> <p>Botanical nomenclature: naming plants; scientific vs vernacular names, binomial nomenclature.</p> <p>International Code of Nomenclature for Algae, Fungi and Plants (ICN): Principles, rules and recommendations covering typification, nomenclatural types, ranks, author citation, valid publication, priority of publications, name changes, synonyms, conservation and rejection of names.</p>	25
4.	<p>Herbaria and herbarium techniques: methods plants collections and documentation; preparation and preservation of herbarium specimens, herbarium operations; virtual herbarium; major herbaria of the world and India. Functions of Herbaria.</p> <p>Botanical Survey of India: Objectives and major contributions.</p> <p>Botanic gardens: Role of Botanical Gardens in taxonomic studies; major botanical gardens of the world and india.</p>	25

Teaching-Learning Methodology	<p>Topics of the course will be taught through interactive classes using appropriate tools and techniques.</p> <p>Students will be encouraged to explore different sources of data pertained to the course.</p> <p>Course materials will be provided from primary and secondary sources of information.</p>
-------------------------------	---

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%





Course Outcomes: Having completed this course, students will be able to

1.	Develop familiarity with the local flora, identification of flowering plants using taxonomic keys.
2	Become familiar with different principles, rules involved in naming plants and changing names.
3.	Appraise different systems of plant classifications.
4.	Make identification keys for local flora.
5.	Familiar with field collections and process of plant samples, preparation and preservation herbarium specimens.
6	Familiar with modern tools and techniques employed in plant systematics.

Suggested References:

Sr. No.	References
1	Angiosperm Phylogeny Group. 2016. An update of the Angiosperm Phylogeny Group Classification for the orders and families of flowering plants: APG IV. Botanical Journal of the Linnean Society 181: 1-20.
2	Cook T 1903. The Flora of Presidency of Bombay, Vol. I (Indian Reprint) Bishen Singh, Mahendra Pal Singh, Dehradun.
3	Crawford, D.J. 2003. Plant Molecular Systematics. Cambridge University Press, Cambridge, UK.
4	Cronquist A. 1981. An Integrated System of Classification of Flowering plants.
5	Cronquist A. 1988. Evolution and Classification of Flowering Plants, 2nd edn, N Y Botanical Garden.
6	Davis P H and Heywood V H.1963. Principles of Angiosperm Taxonomy, Oliver and Boyd.
7	Dhalgren P. M. T. 1981. Angiosperm Classification and Phylogeny –Flowering Plants.





SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25))
Syllabus with effect from the Academic Year 2021-2022

8	Erdtman G 1966. Pollen Morphology and Plant Taxonomy of Angiosperms (An introduction to Palynology I), Hafner Pub. Co. London.
9	Hickey M and King C. 2000. The Cambridge Illustrated Glossary of Botanical Terms. Cambridge University Press, UK.
10	Jain S. K. and Rao R. R. Handbook of Field and Herbarium Methods, Today and Tomorrow Publishers, New Delhi.
11	Jones S B and Luchinger A E (1986). Plant Systematics 2nd edn, McGraw Hill Book CO.
12	Judd et al. 2007. Plant Systematics – A phylogenetic approach. Sinauer Pub. 3rd edition
313	Judd, W.S., Campbell, C.S, Kellogg, E.A., Stevens, P.A. and Donoghue, M.J. 2016. Plant Systematics: A Phylogenetic Approach. Sinauer Associates, Inc., Massachusetts.
14	Lawrence G. H. M. 1951. Taxonomy of Vascular Plants. Macmillan.
15	Mabberly T J. 1997. The Plant Book 2nd edn Cambridge University Press, Cambridge.
16	Naik V. N. 1984. Taxonomy of Angiosperms. TMH, New Delhi.
17	Radford A E. 1986. Fundamentals of Plant Systematics, Harper and Row N Y.
418	Simpson, M.G. 2010. Plant Systematics. Elsevier, Amsterdam.
19	Singh G (2004). Plant Systematics, 2nd edn, Oxford and IBH, New Delhi.
20	Sivrajan V V (1984). Introduction to Principles of Plant Taxonomy, Oxford and IBH, New Delhi.
21	Sporne, K. R. The Morphology of Angiosperms. B. I. Publishing Pvt. Ltd., Bombay.
22	Stace C. A. 1980. Plant Taxonomy and Biosystematics.
23	Stewart, W. N. and Rathwell, G. W. Paleobotany and the Evolution of Plants. Cambridge University Press.





24	Stuessy, T.F. 2009. Plant Taxonomy: The systematic Evaluation of Comparative Data. Columbia University Press, New York.
25	Stuessy, T.F., Crawford, D.J., Soltis, D.E. and Soltis, P.S. 2014. Plant Systematics: The origin, interpretation, and ordering, of plant biodiversity. Koeltz Scientific Books, Konigstein, Germany.

On-line resources to be used if available as reference material
On-line Resources
Relevant review articles/research papers/handouts of latest development in the subject

LABORATORY EXERCISES

1. Description of specimens from locally available representative families.
2. Description of a genus based on 3-4 different species.
3. Comparison of different species of a genus and different genera of a family to calculate similarity coefficients.
4. Identification of plant specimens using floras and identification keys.
5. Preparation of identification keys for at least 10 specimens based on morphological features.
6. Study of herbarium specimens of different families covered in theory course.
7. Field trips within and around the campus; compilation of field notes and preparation of herbarium sheets of such plants, wild or cultivated, as are abundant.
8. Use of palynological, chemical methods in taxonomy
9. Use of molecular markers to determine genetic relatedness between species
10. Construction of dendrograms using appropriate software.

