

GONDWANA UNIVERSITY
GADCHIROLI

SEMESTER SYSTEM PATTERN SYLLABUS

for

B.Sc.

BOTANY

SEMESTER- III

(With effect from: 2013-14)

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B.Sc. BOTANY
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B.Sc.

SEMESTER – III

Paper – I	: Taxonomy & Diversity of Angiosperms	50 marks
Paper – II	: Reproductive Biology of angiosperms & Plant Resources	50 marks
Practical – I	: Based on Paper – I & II Of Semester- III	30 marks
Internal Assessment	: Based on Assignment/ Seminar & Unit test	20 marks

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SEMESTER – III
Paper – I

Taxonomy & Diversity of Angiosperms

UNIT – I :

- 1) Angiosperms: Origin (Bennettitalian Theory).
- 2) Example of primitive angiosperm – *Magnolia*.
- 3) Fossil Angiosperms : Flower-*Saharianthus*, Fruit-*Enigmocarpon*.
- 4) Botanical Nomenclature: Principles, rules, taxonomic ranks, typification.
- 5) Brief History of classification: Theophrastus and Linnaeus

UNIT – II :

- 6) Classification of Angiosperms: Types (Artificial, Natural and Phyllogenetic),
System proposed by Bentham and Hooker and its Merits & Demerits
- 7) Herbarium Techniques: Classical and Virtual (Digital)

UNIT – III :

- 8) Diversity of flowering plants: Dicot families – Ranunculaceae, Brassicaceae,
Malvaceae, Fabaceae, Caesalpiniaceae, Mimosaceae, Solanaceae

UNIT – IV :

- 9) Dicot families (contd.) – Lamiaceae, Apocynaceae, Asclepiadaceae, Asteraceae
& Euphorbiaceae
- 10) Monocot families – Liliaceae, Poaceae and Orchidaceae

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Paper – II

Reproductive Biology of Angiosperms & Plant Resources

UNIT- I:

1. Structure of Anther, Microsporogenesis and Male gametophyte
2. Structure of Pistil, Megasporogenesis and Female gametophyte (Polygonum type).
3. Types of Embryosac (Mono, bi & tetrasporic)
4. Structure and types of Ovules.
5. Pollination : types , contrivances of self and cross pollination, Attractions and Rewards
6. Pollen –pistil interaction and self-incompatibility
7. Double fertilization and Triple fusion

UNIT- II:

8. Seed : Endosperm and its types, Embryo and its types , development of dicot embryo (Onagrad type)
9. Significance of seed: suspended animation, ecological adaptations, unit of genetic recombination & replenishment
10. Seed dispersal strategies

UNIT- III:

11. Plants as a Natural Resources: Food, fiber, wood, tannins, dyes, rubber, gum, resins, fumicatories & masticatories, medicinal plants, vegetable oils & fats, sugars & starches, waxes, cellulose, beverages, spices & condiments etc.
12. Management Practices: Need.
13. Methods of Management: sustainable utilization, gene bank, participatory management, *in-situ* and *ex-situ* conservation.

UNIT- IV:

14. Utilization of plant resources:

- i. Bio- diesel: Process of oil extraction, process of biodiesel production.
e.g., *Pongamia pinnata* (karanji), *Jatropha curcus* (Chandrajyoti)
- ii. Essential oils: Process of oil extraction and commercial uses of *Cymbopogon citratus* (lemon grass oil) , *Vetiveria zizanioides* (Khus)
- iii. Gum : Harvesting and commercial uses of *Acacia nilotica* (Babhul) and *Sterculia urens* (Karu)
- iv. Spices: Cultivation, processing and commercial uses of Turmeric (Haldi), *Capsicum spp.* (Chilli)

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SUGGESTED LABORATORY EXERCISES

Make use of the permanent micro preparations, specimens, transparencies, photographs, temporary mounts, etc.

1. Study of *Saharianthus*, *Enigmocarpon*
2. Study of locally available plants belonging to families included in the syllabus
3. Structure of anther, ovule, endosperm and embryo-sac
4. Types of ovules
5. To calculate the percentage pollen germination in the given specimen e.g.
Catharanthus roseus, *Datura stramonium*.
6. Virtual (Digital) herbarium and collection of plant resources available in the area
7. Demonstration of oil extraction from *Pongamia pinnata*
8. Processing of Turmeric
9. Estimation of **Capsicin** from *Capsicum spp.* (chilli)

NOTES:

1. Frequent field visits in the surrounding areas to study the vegetation are necessary.
2. One long excursion is necessary along with excursion report duly signed by HOD.
3. The teacher should prevent students from collecting plants from the wild and submitting for practical examination, instead the students should be asked to prepare the field report [photographic evidences, virtual (Digital) herbarium can be given.]

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Schedule for Practical Examination

Time: 5 Hours

Max. Marks: 30

- Q 1. Describe in technical language the given angiospermic material. Classify and Identify the Family giving reasons. 06 Marks
- Q 2. Write floral formula and draw floral diagram of the given Flower, 03 Marks
- Q 3. Demonstrate the process of oil extraction of the given material. 06 Marks
- Q 4. Calculate the percent pollen germination in given specimen. 03 Marks
- Q 5. Spotting
- [A] Fossil Angiosperms
 - [B] Herbarium tool
 - [C] Embryology
 - [D] Plant Resources
 - [E] Plant Resources 05 Marks
- Q 6. Viva-voce 02 Marks
- Q 7. Practical Record & Excursion Report 05 Marks
- TOTAL- 30 Marks**

NOTE: Well labelled diagrams are expected wherever necessary

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REFERENCE BOOKS

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- 3 Heywood, V. H. and Moore D. M.(eds)1984. Current concepts in plant Taxonomy. Academic Press London
- 4 Jeffrey, C. 1983. An Introduction of plant Taxonomy. Cambridge University Press, Cambridge, London.
- 5 Jones, S. B. Jr. and Luchsinger A. E. 1985. Plants systematic (2nd Edn.). McGraw Hill Book Co. New York.
- 6 Maheshwari, J. K. 1963. Flora of Delhi. CSIR, New Delhi
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- 13 Pande, P. B. Text Book of Botany. S. Chand & Co.
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- 22 Dr. T.N.More, Dr.K.N.Dhumal, H,S.Patil , Dr.S.S.Gadekar and Dr.A.D.More, 2011. A Text Book of Plant Diversity and Plant Resources , Management and Utilization. Nirali Prakashan , Pune
- 23 Kocchar, S.L. 2000. Economic Botany in Tropics, 2nd Edn., *Macmillan India Ltd., New Delhi*
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- 26 Sharma, O.P. 1996. Hill's Economic Botany (adapted by O.P. Sharma) *Tata McGraw-Hill Co. Ltd., New Delhi*
- 27 Simpson, B.B. and Conner-Ogorzaly, M. 1986. Economics Botany-Plants in Our World, *McGraw-Hill Book Company, New York*
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29. Council of Scientific & Industrial Research- 1986. The Useful Plants of India. *Publications ad Information Directorate, CSIR, New Delhi*
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31. Swaminathan, M.S. and Kocchar, S.L. (eds) 1989. Plant and Society. *Macmillan Publications Ltd., London*
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