

GUJARAT UNIVERSITY
Ahmedabad



B. Sc. Semester-II
BOTANY MULTIDISCIPLINARY SYLLABUS
MDC- BOT -124 T and 124 P (2 + 2 Credits)
Based on NEP 2020 Guidelines
Effective from June - 2024

Core course (CC)	Botany Theory	Botany Practical
Paper No.	MDC-BOT 124 T	MDC-BOT -124 P (Part A/ Session-I + Part B/ Session-II)
Credit	02Credit	02 Credit
Teaching hours/ week	02Hours	02 Hours (Part A-02 hours + Part B-02 hours)
Examination (External + Internal)	50 Marks	50 Marks
Semester end External Examination	25 Marks	25 Marks (Part A-25 Marks + Part B-25 Marks)
Internal Exam	25 Marks [15 (Written test), 10 (Assignment, Seminar/Quiz, Attendance)]	25 Marks [15 (Written test) 10 (Project, Attendance)]
Semester end External Examination duration	2 Hours	6Hours Part A- 3hours + Part B -3hours

Detailed Curriculum has been designed as per NEP-2020 semester system.

There shall be one theory papers having four units each and one practical paper in semester.

Each practical batch will be of 20 students.

Students must be taken on a Botanical excursion / Field Trip or visit to a Research Academic Institute, Science / Space exhibition, Participation in science based seminars to enhance the study experience.

Students must record the laboratory work done in a journal. The journal is to be certified by the Teacher in-charge and Head of the department.

Duly certified journals have to be produced while appearing at the time of university exam.

Project work should be in tune with the syllabus and the presentation will carry due weight-age.



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NEP 2020 Syllabus: Effective from June - 2023

Unit –1 Indian Knowledge System in Botany- I:

15 hours

- Indian contribution to science and technology in the pre-independence era
- Inspiring lives of scientists: Dr. H.G. Khorana, Sir J. C. Bose, P. Maheshwari, Birbal Sahni, E. K. Janaki Ammal, M. S. Swaminathan
- Vedic classification of plants ; Parasher's classification
- Parts of a plant as per Indian knowledge system
- Plants in religious beliefs
- Food and medicinal plants in ancient India: Name, family, useful part, brief description, important chemical constituents if any, climate and cultivation (only for cereals and oil seeds) and uses of the following plants cultivated in India since ancient times: Cereals- Wheat, Rice
- Oil seeds- Ground Nut
- Medicinal plants- Guggal, Neem, Brahmi and Ashwagandha

Unit-2 Plant Morphology, Horticulture and gardening.

15 hours

Plant Morphology

- Phyllotaxy and Types of leaves
- Types of stipules and their modifications
- Bracts: Scaly, Involucral, Foliaceous, Petaloid and Spathe
- Inflorescence: Racemose – Raceme, Spike, Catkin, Spadix, Umbel, Capitulum
Cymose – Solitary: terminal and axillary, Uniparous, Biparous, Multiparous cymes.
- Types of Flowers based on position of ovary
- Aestivation and Placentation
- Study plant family: Malvaceae, Amaryllidaceae- Classification with reasons as per Bentham and Hooker, General features, Floral formula and examples of at least two important plants with scientific names

Horticulture and Gardening

- Horticulture: Definition, Scope and Branches

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- Gardening: Introduction, Uses of Gardens, Types of Gardens (Kitchen, Water and Vertical Gardens)
- Garden Equipments: Sprinkler, Hoe, Scissors, Hose pipe, Watering can
- Names and flowering times of 5 ornamental flowering trees, shrubs, foliage, climbers
- Asexual plant reproduction-Cutting, Layering

Practical Details

Session-A

- 1) Phyllotaxy- Alternate, Opposite, Verticillaster
- 2) Types of leaves
- 3) Types of Stipules & their Modifications
- 4) Types of Bracts- Foliaceous, Involucral, Spathe, Petaloid
- 5) Types of Flowers based on position of ovary-3 types
- 6) Racemose inflorescence- Raceme, Spike, Spikelet, Catkin, Umbel, Capitulum
- 7) Cymose inflorescence – Solitary –Terminal and Axillary; Monochasial- Helicoid and Scorpioid; Dichasial or Biparous and multichasial(-multiparous)
- 8) Aestivation
- 9) Placentation
- 10) and 11) Study of Plant families- *Malvaceae*, and *Amaryllidaceae* - Classification with reasons, Identifying characters, floral formula, androecium, gynoecium and TS of ovary; botanical and common names of at least two examples.
- 12) Study of cereals, oil plant, medicinal plants as per theory syllabus through specimens, charts or slides
- 13) Study of Garden tools as per theory syllabus through charts, models or slides- Scissors, Hoe, Hose, Watering can, Sprinkler
- 14) Study of five common avenue trees with local names and scientific names- Neem, Piludi, Bardi, Amaltas, Asopalav, by specimen, chart or photographs
- 15) Study of ornamental plants with local names and scientific names- Hibiscus, Ixora, Vinca, Rose, Galtoro by specimen, chart or photograph

- 16) Study of climber plants with local names and scientific names- Madhumalti, Jasmine, Jacquemontia, Tecoma, Money plant, Bougainvillia by specimen, chart or photograph
- 17) Chart of root cutting-chickoo, stem cutting-dracaena, leaf cutting-Bryophyllum, Basic or general chart of ground and air layering
- 18) Preparation of at least 3 herbarium sheets of available plants

References:

- Indian Contributions to Indian Science, by Vignan Bharti, Turtle Book pvt.limited
- Manual of Ethnobotany by S. K. Jain; 2nd Revised Publication, Scientific Pub.,2018
- Handbook of Ethnobotany , S.K. Jain, M/s Bishen Singh Mahendra Pal Singh Pub
- Ethnobotany Volume-I, Dr. Sureshkumar, Kojo Press
- Economic Botany – Pandey & Chaddha, Vikas Publishing House Pvt. Ltd. NewDelhi.
- Economic Botany – N.S. Subramanyam &A.V.S.SambaMurty, Wiley Eastern Ltd..
- Economic Botany – B.P. Pandey, Chand & Co., New Delhi
- Economic Botany – A.F. Hill & O.P.Sharma, Tata McGraw Hill, New Delhi
- Naik, V.N. 1984. Taxonomy of Angiosperms. Tata McGraw - Hill Publishing Co.Ltd. New Delhi
- College Botany Volume-I, B.P. Pandey, S. Chand Publishing
- Systematic botany By R.N. Sutaria , Khdayata Book Depot.
- Gardens – LaeeqFutehally A New Course in Botany – Kumar, Pradhan, Sharma, Sarangdhar, Sheth Publishers, Mumbai.
- ‘Nisarg vandana’: A Handbook of 75 Cultivable trees by Alpana Shukla; published by The Gujarat Institute of Architects and Civil Engineers (GICEA); 2022
- Horticulture and Plant Breeding by V. Kumaresan, Saras Publication
- Botany for degree students, Pteridophytes, B.R. Vashishta et.al. S. Chand & Co Ltd.
- Botany for degree students, Gymnosperms, B.R.Vashishta et.al. S. Chand & Co Ltd.
- Botany for degree students, Bryophyta, B.R.Vashishta et.al. S. Chand & Co. Ltd.
- Plant cell and tissue culture – S. Narayanswamy, Tara McGraw Hill Pub.2004.
- Plant tissue culture, Applications and limitation – Bhojwani S.S.
- Plant cell culture – Collins H. A. & Edwards 1998
- Elements of Biotechnology – Rastogi Publications Molecular Biology- David Freifelder
- Fundamentals Of Molecular Biology – Veer Bala Rastogi.
- An Introduction to Plant Biotechnology – H.S.Chawla, Oxford & IBH publishing Co. Pvt. Ltd. New Delhi, 2008
- Biotechnology- U. Satyanarayana, Books and Allied (P) Ltd. Kolkata, 2008