

GUJARAT UNIVERSITY

Ahmedabad



B. Sc. - BOTANY

Semester – I

(Theory and Practical)

BASED ON NEP 2020 GUIDELINES

Effective from June - 2023

Core course (CC)	Botany Theory	Botany Practical
Paper No.	BOT DSC - C - 111 T	BOT DSC - C – 112 P (Part A / Session-I + Part B / Session-II)
Credit	04 credit	4 credit
Teaching hours / week	04 hours	08hours (Part A -04 hours + Part B -04 hours)
Examination marks (External + Internal)	100 marks	100 marks (Part A-50 marks + Part B-50 marks)
Semester end External Examination Marks	50 marks	50 marks (Part A - 25 marks + Part B - 25 marks)
Internal Exam. Marks.	50 marks (Written Test, Assignment, Seminar / Quiz , Attendance)	50 marks (Part A -25 marks + Part B -25 marks)
Semester end External Examination Duration	04 hours	08 hours Part A- 04.00 hours + Part B -04.00 hours

- Detailed Curriculum has been designed as per UGC NEP 2020 guidelines and KCG framework system.
- In Sem I and Sem II, there shall be one theory paper having four units each and one practical paper also having 4 credits each.
- For full exposure to plant science, students must be taken on a Botanical excursion / Field Trip or visit to a Research /Academic Institute of relevance
- Science / Space exhibition , Participation in science based seminars to enhance the study experience is advised.
- 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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Name: INTRODUCTORY BOTANY

Course code: DSC-C-BOT 111 T (Theory)

Credits: 04

Teaching Hours: 04 hours / Week

Total Marks : 100 (External 50 + Internal 50) Marks

Learning Objectives:

- To understand the fundamental concepts of botany and basic knowledge of plant science.
- To study the ecosystem its components and various energy equations, ecological pyramids.
- To understand soil complex, its components, its need for plants, formation of soil and soil conservation.
- To study the lower groups of plants like algae as well as fungi and lichens
- To know the concepts of hybridization and shape of the molecules.
- To understand the fundamental concepts of genetics and heredity.
- To teach practical aspects involved in botany like, microscopy, chart making, soil analysis, genetical problems
- To make the student aware of the wide scope of Botany as a core subject.

Learning Outcomes

By the end of the course, the students will be able to:

- Know about Plants in various ecosystems and purpose of studying ecosystems as well as ecosystem dynamics
- Understand basic soil science and be able to perform soil analysis vis a vis soil texture, pH, electrical conductivity, etc.
- Understand the distinguishing features and life cycles of some typical algae and fungi.
- Be able to solve genetics problems based on Mendelian genetics.



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1. *Mucor* 2. *Agaricus*

- Mushroom Cultivation – Importance
- Economic importance of fungi.
- Study of Lichens and their types

UNIT – B2 : Genetics .

To acquaint students with fundamentals of Heredity and Variation.

- Pea plant as the original plant material for heredity studies
- Mendelian genetics:
- Monohybrid ratio, Dihybrid ratio.
 - Mendelian laws of heredity
 - Problems related to Mendelian laws
 - Introduction to Gene interactions:
 - Allelic interactions- definition, complete and incomplete dominance, co-dominance
 - Pleiotropism, penetrance, expressivity
 - Cytoplasmic inheritance : Definition and Example of *Mirabilis*

Suggested Reading:

- (i) A Textbook of Botany vol. I and II S.N. Pandey, P. S. Trivedi and S. P. Misra., Vikas Publication House Pvt. Ltd.
- (ii) Collage Botany Vol. I & II Das, Dutta, Gangulee and Kar., New Central Book Agency
- (iii) Algae ,Fungi, Bryophyte, Pteridophyte by Vasishta., S. Chand Pub, New Delhi
- (iv) Smith, G. M. 1972. *Cryptogamic Botany*. Vol. 1 & 2. Tata McGraw Hill Publishing Co. Ltd. New Delhi.
- (v) Webster, J.1985. *Introduction to Fungi*. Cambridge University Press.
- (vi) Lewin, B.2000. *Genes VIII*. Oxford University Press, New York.
- (vii) Kleinsmith, L.J. and Kish, V.M.1995. *Principles of cell and Molecular Biology* (2nd Ed.). Harper Collins College Publishers, New York, USA.
- (viii) Cytogenetics by S. Sundara Rajan., First edition, Anmol Publications, New Delhi
- (ix) Plants and Environment by Daubenmire (Wiley-Eastern Pvt. Ltd., New Delhi)
- (x) Ecology and Environment by P.D.Sharma Rastogee Publication
- (xi) Fundamentals of Ecology- P. Odum
- (xii) Indian Manual of Plant Ecology – R .Misra & G. S. Puri
- (xiii) Strickberger, M.W. 2008. *Genetics*. PHI Learning Pvt. Ltd. New Delhi.
- (xiv) Arumugon, N. *Cell Biology, Genetics, Evolution*. Saras Publication, Kanyakumari.



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Effective from June - 2023

Name: INTRODUCTORY BOTANY

Course code: DSC-C-BOT 112 P (Practical) (Based on BOT 111T)

Credits: 04

Teaching Hours: 08 hours / Week

Total Marks : 100 (External 50 + Internal 50) Marks

Objective:

- To perform practical to understand the theory taught.
- To understand laboratory techniques.

Learning Outcome: After doing the practical, the student will be able to:

1. Understand lab work for Botany as a core/minor/interdisciplinary subject
2. Understand microscopy and know about care and maintenance of microscopes
3. Maintain practical journal with diagrams, charts and tables
4. Understand, in practical, theory aspects taught.

List of Practicals

(4 hours per practical)

1. Study of Microscopy
2. Study of Chart of Ecosystem classification
3. Study of artificial ecosystem by Terrarium chart/model
4. To study components of pond ecosystem
5. To study components of grassland ecosystem
6. Study of Biotic factors-I
7. Study of Biotic factors-II
8. Study of Ecological Instruments- Soil thermometer, Sling psychrometer, Anemometer
9. Study of Soil Profile- Chart/model
10. Study of Soil texture, Types of soil
11. Electrical conductivity of soil
12. Study of soil Water holding capacity



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13. Study of Soil pH
14. Rapid test for soil CO₂, NO₃
15. Internal Test
16. Chart of Algae-Classification by Smith
17. Study of *Spirogyra*
18. Study of *Nostoc*
19. Chart of Fungi classification-Ainsworth
20. Study of *Mucor*
21. Study of Mushroom
22. Demonstration of Mushroom Cultivation
23. Study of Lichens and types by chart/specimen/slides
24. Study of 7 Mendelian characters in Pea plant –chart/specimen
25. Chart of Mendelian Genetics
26. Mendelian Genetics Examples-I
27. Examples-II
28. Chart of cytological inheritance-*Mirabilis*
29. Project preparation
30. Internal Test

Suggested Reading:

1. Practical Botany vol. I & II By Bendre and Kumar, Rastogi Publication.
2. Practical Botany by S. C. Santra, Chettarjee and Das, New Central Book Agency.
3. Experimental Plant Ecology by Pratim Kapur and Sudha Rani, CBS Publication.

Suggested Assessment methods:

Test, Quiz, Presentation, Group Discussion, Abstract writing, Assignment, Project making, Chart making, etc.