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## SECOND YEAR BACHELOR OF SCIENCE MINOR BOTANY REVISED SYLLABUS ACCORDING TO CBCS NEP2020

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COURSE TITLE: BOTANY PRACTICAL SEMESTER-IV, W.E.F. 2024-2025

**RECOMMENDED BY THE BOARD OF STUDIES IN BOTANY  
AND**

**APPROVED BY THE ACADEMIC COUNCIL**

Devrukh Shikshan Prasarak Mandal's

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and  
Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.  
Tal.Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: 03

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|---|---|--|
| Name of the Implementing Institute            | : | Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, Dist. Ratnagiri-415804, |
| Name of the Parent University                 | : | University of Mumbai   |
| Name of the Programme                         | : | Bachelor of Science  |
| Name of the Department                        | : | Botany   |
| Name of the Class                             | : | Second Year  |
| Semester                                      | : | Fourth   |
| No. of Credits                                | : | 02   |
| Title of the Course                           | : | Botany Practical   |
| Course Code                                   | : | S204BTP  |
| Name of the Vertical in adherence to NEP 2020 | : | Minor  |
| Eligibility for Admission                     | : | FY BSc Pass seeking Admission to SY BSc. Programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra                 |
| Passing Marks                                 | : | 40%  |
| Mode of Assessment                            | : | SSE  |
| Level   | : | UG   |
| Pattern of Marks Distribution for TE and CIA  | : | 60:40  |
| Status  | : | NEP-CBCS   |
| To be implemented from Academic Year          | : | 2024-2025  |
| Ordinances /Regulations (if any)              |   |  |

## Syllabus for Second Year of Bachelor of Science in Botany

(With effect from the academic year 2024-2025)

**SEMESTER-IV**

**Paper No.– Botany Paper – II**

**Course Title: Botany Practical**

**No. of Credits - 02**

**Type of Vertical: Minor**

**COURSE CODE: S204BTP**

### Learning Outcomes Based on BLOOM's Taxonomy:

After completing the course, the learner will be able to...

| Course Learning Outcome No. | Blooms Taxonomy | Course Learning Outcome  |
|-----------------------------|-----------------|--|
| CLO-01                      | Remember        | Recall the systematic position, occurrence, uses of <i>Xylaria</i> , <i>Pinus Cordaites</i> and Economic important families. Memorise dicot stem, root, growth rings, vascular bundles, and community characters.  |
| CLO-02                      | Understand      | Explain the structure of <i>Xylaria</i> , <i>Pinus Cordaites</i> and important characters of families with labelled diagrams. Recognise normal secondary growth, conducting tissues, Growth rings, periderm, lenticels, tyloses, heart wood and sap wood |
| CLO-03                      | Apply           | Apply laboratory skills for preparation of various slides, study of Powdery mildew disease, Late blight of potato disease, herbarium and wet preservation technique  |
| CLO-04                      | Analyse         | Separate carotenoids by thin layer chromatography, Analyze germinating seeds using Phenol red indicator, working of the following Ecological Instruments- Soil thermometer, Soil testing kit, Soil pH, and Wind anemometer, Mechanical analysis of soil  |
| CLO-05                      | Evaluate        | Estimate proteins by Lowry's method, Evaluate vegetation by the list quadrant method, NR activity – in-vivo  |

## Syllabus for Second Year of Bachelor of Science in Botany

(With effect from the academic year 2024-2025)

**SEMESTER-IV**

**Paper No.– Botany Paper –II**

**Course Title: Botany Practical**

**No. of Credits - 02**

**Type of Vertical: Minor**

**COURSE CODE: S204BTP**

| Course Content |   |    |    |
|----------------|---|----|----|
| Module         | Practicals  | Cr | L  |
|                |   | 02 | 60 |
| I              | 1. Study of stages in the life cycle of <i>Xylaria</i> from fresh/ preserved material and permanent slides.<br>2. Study of Powdery mildew disease<br>3. Study of Late blight of potato disease.<br>4. Study of stages in the life cycle of <i>Pinus</i> from fresh/ preserved material and permanent slides.<br>5. Study of the form genus <i>Cordaites</i> with the help of permanent slide/photomicrographs.<br>6. Study following families prescribed: morphological peculiarities and economic importance of the members<br>Fabaceae,<br>Asteraceae<br>Arecaceae<br>7. Preparation of herbarium and wet preservation technique<br>8. Separation of Carotenoids by thin layer chromatography   |    |    |
| II             | 1. Study of normal secondary growth in the stem and root of a Dicotyledonous plant<br>2. Study of conducting tissues- Xylem and phloem elements in Angiosperms as seen in LS and through maceration technique.<br>3. Study of different types of vascular bundles.<br>4. Growth rings, periderm, lenticels, tyloses, heart wood and sap wood<br>5. Q10 – germinating seeds using Phenol red indicator<br>6. NR activity – in-vivo<br>7. Estimation of proteins by Lowry’s method (Prepare standard graph).<br>8. Study of the working of the following Ecological Instruments- Soil thermometer, Soil testing kit, Soil pH, and Wind anemometer.<br>9. Mechanical analysis of soil by the sieve method & pH of soil.<br>10. Study of vegetation by the list quadrant method |    |    |
| Total          |   | 02 | 60 |

### **Required Previous Knowledge**

To study module -I the basic knowledge of fundamentals of Biology, branches of Biology, basics of Viruses, Bacteria, Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperm and angiosperm is necessary before starting to learn the course

To study module -II the basic knowledge of fundamentals of Biology, branches of Biology, basics of Cell biology, Plant Physiology, Ecology and Genetics is necessary before starting to learn the course

### **Access to the Course**

The course is available for all the students admitted for Bachelor of Science as a Major or a minor. The students seeking admission in other disciplines may select the course as a minor considering the terms and conditions laid down by the University of Mumbai, the Government of Maharashtra, and the college, from time to time.

### **Forms of Assessment**

Courses having laboratory sessions shall be assessed at the end of each semester. The pattern will be followed as passed in Academic Council of the college.

### **Grading Scale**

The grading scale used is O to F. Grade O is the highest passing grade on the grading scale, and grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

## **Reference Books**

1. College Botany Volume I and II by Gangulee, Das and Dutta. Central Education Enterprises
2. Cryptogamic Botany Volume I and II by G M Smith, McGraw Hill.
3. Text book of Fungi by O.P. Sharma, Tata McGraw
4. Morphology and Evolution of Vascular Plants by Gifford, E. M. and Foster, A. S., W.H. Freeman & Co., New York.
5. Cryptogamic Botany Vol. I & II (2nd Edition) by Gilbert, M. S., Tata McGraw Hill Publishing Co., Ltd New Delhi.
6. Introductory Phycology by Kumar, H. D. 1988, Affiliated East-West Press Ltd., New York.
7. Comparative Morphology of Vascular Plants by Foster, A. S. and Gifford, A.E.M. jr. Vakils, Peffer & Simons Pvt., Ltd.
8. The Morphology of Angiosperms by Sporne, K.R. B.I. Publication, Bombay.
9. Taxonomy of Vascular Plants by Lawrance. G.H.M. 1951. MacMillan, New York.
10. Environmental Science: A Global Concern by Cunningham.W.P. and Saifo S.W. 1997. WCB. McGraw Hill.

*Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce and Vid. Dadasaheb Pitre Science College, Devrukh (An Autonomous College Affiliated with University of Mumbai)*

11. Biochemistry and Molecular Biology of Plants. by Buchanan. B.B. Grusse. W. and Jones. R.L. 2000. American Society of Plant Physiologists, Maryland, USA.
12. Plant Metabolism (2nd Edition) by Collins. H.A. and Edwards D.H. Lefebvre. D.D. and Layzell. D.B. (eds) 1997. Longman, Essex, England
13. Genetics by Russel. Wesley Longman inc publishers. ( 5th edition)
14. Plant Physiology by Taiz and Zeiger Sinauer Associates inc. publishers
15. Fundamentals of Ecology by E P Odum and G W Barrett. Thompson Asia Pvt Ltd. Singapore.
16. Cell Biology by De Robertis
17. A Text Book of Systematic Botany by Sutaria R N
18. Taxonomy of Angiosperms by Pandey S N and Mishra S D
19. A text book of Plant Ecology by Ambasht R.S.
20. Fundamentals of Cytology by L. W. Sharp.
21. Taxonomy of Angiosperms by V.N. Naik, Tata McGraw Hill
22. Plant Systematics: An integrated Approach by Gurcharan Singh, Science Publ.
23. Prescott, L.M., Harley J.P., Klein D. A. (2005). Microbiology, McGraw Hill, India. 6th edition.
24. Pelczar, M.J. (2001) Microbiology, 5th edition, Tata McGraw-Hill Co, New Delhi.