

Academic council dated 15th July 2023 as per Item No. 1.03



**Dombivli Shikshan Prasarak Mandal's K.V.Pendharkar College of Arts, Science and Commerce (Autonomous)
Dombivli (E), Thane 421203**

(Affiliated to University of Mumbai)

Faculty of Science

Department of Botany

PROGRAMME: BACHLOR of SCIENCE (B.Sc.)

Syllabus For

F.Y. B.Sc. (Semester I and II)

Choice Based Credit System (CBCS)

(as per NEP – 2020)

Syllabus w.e.f Academic Year 2023-24 (CBCS)

F.Y.B.Sc. Semester- I
Botany-I

Course Code: BO23101MN Credits: 02

Course Outcomes: On completion of this course the student would be able to: CO1: Gain knowledge about the general characters of division Chlorophyta (i.e. and its economic importance) and to understand the systematic position, life cycle of *Spirogyra*. CO2: Know economic importance of Algae with respect to Chlorophyta. CO3: Understand the life cycle of *Rhizopus* and to learn the mode of nutrition in Fungi especially Saprophytism and Parasitism. CO4: Study the systematic position, structure, life cycle of *Riccia* and economic importance of bryophytes. CO5: Able to learn concept of energy pyramid and ecosystem types with energy flow. CO6: Structure and function of nucleus along with stages of mitosis. CO7: Learn various biostatistical techniques such as mean, mode, median, standard deviation etc.

Unit	Botany Paper I	Lectures (30)
I	ALGAE AND FUNGI	10
1.1	Structure, life cycle & systematic position of <i>Spirogyra</i> (Chlorophyta)	
1.2	Economic importance of Chlorophyta: with reference to food, industry and as a pharmaceutical	
1.3	Structure, life cycle and systematic position of <i>Rhizopus</i>	
1.4	Introduction to plant pathology and study of early blight of tomato	
II	BRYOPHYTA AND ECOLOGY	10
2.1	Structure, life cycle and systematic position of <i>Riccia</i>	
2.2	Economic importance of Bryophytes	
2.3	Energy pyramids, energy flow in an ecosystem	
2.4	Types of ecosystems: aquatic and terrestrial	
III	GENETICS AND BIOSTATISTICS	10
3.1	Ultra structure and functions of the Nucleus	
3.2	Study of various stages of mitosis	
3.3	Concept of karyotype: Normal male and female)	
3.4	Introduction to Biostatistics: Study of Mean, Mode and Median, Standard Deviation, Frequency Distribution	

SEC: Botany Practical Paper I
Course Code: BO23103SE Credits: 02

SEMESTER I		Cr. 2
Botany Practical Paper I		
1	How to use a compound microscope	
2	Life cycle of <i>Spirogyra</i> from fresh/ preserved material and permanent slides.	
3	Economic importance of Chlorophyta <i>Ulva</i> (Biofuel) and <i>Spirulina</i> (Nutraceutical)	
4	Life cycle of <i>Rhizopus</i> from fresh/ preserved material and permanent slides.	
5	Early blight of Tomato (Identification with the help of a photograph)	
6	Life cycle of <i>Riccia</i> from fresh/ preserved material.	
7	Identification of cell organelles with the help of photomicrograph: Nucleus	
8	Identification of plants adapted to different environmental conditions: Hydrophytes, Mesophytes, Xerophytes and Halophytes	
9	Study of various stages of Mitosis using Onion root tip	
10	Calculation of mean, median and mode, standard deviation and frequency distribution	
11	Identification of male and female karyotype	
	Excursion Report	

F.Y.B.Sc. Semester- II

Botany Paper II

Course Code: BO23202MN Credits: 02

Course outcomes: The student would be able to: CO1: Understand life cycle, systematic position and alternation of generations in *Nephrolepis*. CO2: Know life cycle, the systematic position and alternation of generations of *Cycas* as well as to know economic importance of Gymnosperm. CO3: Develop critical understanding on morphology of leaf, flower and Inflorescence. CO5: Identify, classify and describe the characteristics of families Combretaceae and Amaryllidaceae CO6: able to have an understanding of Light reactions, photolysis of water, cyclic and non-cyclic photophosphorylation. CO7: Concept of primary and secondary metabolites, difference between primary and secondary metabolites and their applications.

Unit	Botany Paper II	Lectures (30)
I	PTERIDOPHYTES AND GYMNASPERMS	10
1.1	Structure, life cycle, systematic position and alternation of generations in <i>Nephrolepis</i>	
1.2	Structure life cycle systematic position and alternation of generations in <i>Cycas</i>	
1.3	Economic importance of Pteridophytes and Gymnosperms	
II	ANGIOSPERMS AND ANATOMY	10
2.1	Leaf: simple leaf, types of compound leaves, venation, phyllotaxy, leaf apex, leaf margin, leaf base and leaf shapes.	
2.2	Morphology of flowers (Details of all whorls) Concept of inflorescence and its types: Racemose: simple raceme, spike, catkin, spadix, panicle. Cymose: monochasial, dichasial, polychasial, compound corymb and umbel	
2.3	Study of following families with respect to its distinguishing characters, L.S. of flower, T. S of ovary, floral formula and any two plants of economic importance 1. Combretaceae 2. Amaryllidaceae	
2.4	Primary structure of dicot and monocot root and stem	
III	PHYSIOLOGY AND MEDICINAL BOTANY	10
3.1	Concept of Photosynthesis, Pigment system, Photolysis of water Light reactions (Cyclic and Non-cyclic photophosphorylation)	
3.2	Concept of primary and secondary metabolites, difference between primary and secondary metabolites: Tannins and Flavonoids	

SEC: Botany Practical Paper II
Course Code: BO23204SE Credits: 02

	SEMESTER II	Cr. 2
	Botany Practical Paper II	
1	Life cycle of <i>Nephrolepis</i> : Mounting of ramenta, T.S. of rachis and T.S. of pinna passing using sorus	
2	Life cycle of <i>Cycas</i> : Sporophyte of <i>Cycas</i> , T.S. of leaflet (<i>Cycas</i> pinna), Megasporophyll, microsporophyll, coralloid root, microspore, L.S. of ovule of <i>Cycas</i> (Identification)	
3	Leaf morphology and types of inflorescence : as per theory	
4	Study of families prescribed in the syllabus 1. Combretaceae 2. Amaryllidaceae	
5	Primary structure of dicot and monocot root and stem	
5	Separation of chlorophyll pigments by strip paper chromatography.	
6	Change in colour because of change in pH: anthocyanins using black grapes	
7	Test for tannins using tea powder	
8	Excursion Report	

EVALUATION PATTERN

Botany

Type of evaluation	Type of questions	Weightage
Theory: Internal (40%)	One class test (Multiple choice questions)	20 marks
	Assignment submission	20 marks
Theory: External (60%)	Long answer questions (15 Marks/Unit)	45 marks
	Short Notes	15 marks
Practicals (SEC)	Preparation, Presentations, Performing Observations, Calculations, Conclusions, Results, Viva, Field report and Journal	100 marks