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			Cr
Semester I USBO101		**L**	
Paper I -- Plant Diversity 1		**45**	**2**
UNIT I		**15**	
ALGAE			
1	Structure, life cycle and systematic position of *Nostoc* and *Spirogyra*.		
2	Economic importance of Algae.		
UNIT II		**15**	
FUNGI			
1	Structure, life cycle and systematic position of *Rhizopus* and *Aspergillus*		
2	Economic importance of Fungi.		
3	Modes of nutrition in Fungi (Saprophytism and Parasitism).		
UNIT III		**15**	
BRYOPHYTA			
1	General characters of Hepaticae		
2	Structure, life cycle and systematic position of *Riccia*.		

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	Semester I USBO102	**L**	**Cr**
	Paper II – Form and Function 1	**45**	**2**
UNIT I		**15**	
CELL BIOLOGY			
1	General structure of plant cell: cell wall Plasma membrane (bilayer lipid structure, fluid mosaic model)		
2	Ultra structure and functions of the following cell organelles: Endoplasmic reticulum and Chloroplast		
UNIT II		**15**	
ECOLOGY			
1	Energy pyramids, energy flow in an ecosystem.		
2	Types of ecosystems: aquatic and terrestrial.		
UNIT III		**15**	
GENETICS			
1	Phenotype/Genotype, Mendelian Genetics- monohybrid, dihybrid; test cross; back cross ratios.		
2	Epistatic and non epistatic interactions; multiple alleles.		

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	Semester I USBOP1	**L**	**Cr**
	PRACTICAL Paper I – Plant Diversity 1	30	1
1	Study of stages in the life cycle of *Nostoc* from fresh/ preserved material and permanent slides.		
2	Study of stages in the life cycle of *Spirogyra* from fresh/ preserved material and permanent slides.		
3	Economic importance of algae: *Ulva* (Biofuel), *Spirulina* (Neutraceutical), *Gelidium* (Agar)		
4	Study of stages in the life cycle of *Rhizopus* from fresh/ preserved material and permanent slides.		
5	Study of stages in the life cycle of *Aspergillus* from fresh/ preserved material and permanent slides.		
6	Economic importance of Fungi: Mushroom , Yeast, wood rotting fungi (any bracket fungus).		
7	Study of stages in the life cycle of *Riccia* from fresh/ preserved material.		
8	Study of stages in the life cycle of *Riccia* with the help of permanent slides.		
	PRACTICAL PAPER II- FORM AND FUNCTION 1	30	1
1	Examining various stages of mitosis in root tip cells (*Allium)*		
2	**Cell inclusions:** Starch grains (Potato and Rice); Aleurone Layer (Maize)		
3	Cystolith (*Ficus*); Raphides (*Pistia*); Sphaeraphides (*Opuntia*).		
4	Identification of cell organelles with the help of photomicrograph: Plastids: Chloroplast, Amyloplast, Endoplasmic Reticulum and Nucleus.		
4	**Identification of plants adapted to different environmental conditions:** Hydrophytes: Floating: Free floating (*Pistia*/*Eichornia*); Rooted floating (*Nymphaea*); Submerged (*Hydrilla*)		
5	Mesophytes (any common plant); Hygrophytes (*Typha*/*Cyperus*)		

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6	Xerophytes : Succulent (*Opuntia*); Woody Xerophyte (*Nerium*); Halophyte (*Avicennia* pneumatophore) No sections in ecology, only identification and description of specimens. Morphological adaptations only.		
7	Calculation of mean, median and mode.		
8	Calculation of standard deviation.		
9	Frequency distribution, graphical representation of data- frequency polygon, histogram, pie chart.		
10	Study of Karyoptypes: Human: Normal male and female, *Allium cepa* .		

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Semester II USBO201	**Hrs**	**Cr**
Paper I -- Plant Diversity 1	**45**	**2**
UNIT I	**15**	
PTERIDOPHYTES		
1 Structure life cycle, systematic position and alternation of generations in *Nephrolepis*		
2 Stelar evolution		
UNIT II	**15**	
GYMNOSPERMS		
2 Structure life cycle systematic position and alternation of generations in *Cycas*		
3 Economic importance of Gymnosperms		
Unit III		
ANGIOSPERMS	**15**	
1. Leaf: simple leaf, types of compound leaves, Incisions of leaf, venation, phyllotaxy, types of stipules, leaf apex, leaf margin, leaf base, leaf shapes. Modifications of leaf: spine, tendril, hooks, phyllode, pitcher, *Drosera* or insectivorous plants.		
2 Inflorescence: Racemose: simple raceme, spike, catkin, spadix, polyanthus. Cymose: monochasial, dichasial, Compound: corymb, umbel, cyathium, capitulum, verticellaster, hypanthodium.		
3 Study of following families: Malvaceae, Amaryllidaceae.		

Semester II USBO202	**Hrs**	**Cr**
Paper II – Form and Function 1	**45**	**2**
UNIT I	**15**	
ANATOMY		
1 Simple tissues, complex tissues.		
2 Primary structure of dicot and monocot root, stem and leaf.		
3 Epidermal tissue system: types of hair, monocot and dicot stomata		

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UNIT II		**15**	
PHYSIOLOGY			
1	Photosynthesis: Light reactions, photolysis of water, photophosphorylation (cyclic and non cyclic), carbon fixation phase (C3, C4 and CAM pathways).		
UNIT III		**15**	
MEDICINAL BOTANY			
1	Concept of primary and secondary metabolites, difference between primary and secondary metabolites.		
2	Grandma's pouch: Following plants have to be studies with respect to botanical source, part of the plant used, active constituents present and medicinal uses: *Oscimum sanctum, Adathoda vasica, Zinziber officinale, Curcuma longa, Santalum album, Aloe vera*.		

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	Semester II USBOP2	**Cr**
	PRACTICAL Paper I – Plant Diversity 1	**1**
1	Study of stages in the life cycle of *Nephrolepis* : Mounting of ramentum, hydathode, T.S. of rachis.	
2	T.S. of pinna of *Nephrolepis* passing through sorus.	
	3 Stelar evolution with the help of permanent slides: Protostele: haplostele, actinostele, plectostele, mixed protostele, siphonostele: ectophloic, amphiphloic, dictyostele, eustele and atactostele.	
4	*Cycas:* T.S of leaflet (*Cycas* pinna)	
5	Megasporophyll, microsporophyll, coralloid root, microspore, L.S. of ovule of *Cycas* – all specimens to be shown.	
6	Economic importance of Gymnosperms: *Pinus* (turpentine, wood, seeds)	
7	Leaf morphology : as per theory	
8	Types of inflorescence: as per theory	
9	Malvaceae	
10	Amaryllidaceae	
	PRACTICALPaper II – Form and Function 1	**1**
1	Primary structure of dicot and monocot root.	
2	Primary structure of dicot and monocot stem.	
3	Study of dicot and monocot stomata.	
4	Epidermal outgrowths: with the help of mountings Unicellular: *Gossypium*/Radish Multicellular: *Lantana*/Sunflower Glandular: *Drosera* and Stinging: *Urtica* – only identification with the help of permanent slides. Peltate: *Thespesia* Stellate: *Erythrina*/*Sida acuta*/*Solanum*/*Helecteris*	

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	T-shaped: *Avicennia*	
5	Separation of chlorophyll pigments by strip paper chromatography.	
6	Separation of amino acids by paper chromatography.	
7	Change in colour because of change in pH: Anthocyanin: black grapes/Purple cabbage	
8	Test for tannins: tea powder/catechu.	
9	Identification of plants or plant parts for grandma's pouch as per theory.	

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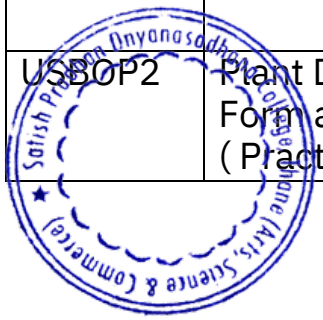
DISTRIBUTION OF TOPICS AND CREDITS
F Y B Sc. BOTANY SEMESTER I

Course	Nomenclature	Credits	Topics
USBO1O1	PLANT DIVERSITY 1	02	1. Algae 2. Fungi 3. Bryophyta
USBO1O2	FORM AND FUNCTION I	02	1. Cell Biology 2. Ecology 3. Genetics
USBOP1	Plant Diversity I, form and Function I (Practical I & II)	02	

F Y B Sc BOTANY SEMESTER II

Course	Nomenclature	Credits	Topics
USBO2O1	PLANT DIVERSITY I	02	1. Pteridophytes 2. Gymnosperms 3. Angiosperms
USBO2O2	FORM AND FUNCTION I	02	1. Anatomy 2. Physiology 3. Medicinal Botany
USBOP2	Plant Diversity I, Form and Function I (Practical I & II)	02	



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1. College Botany Volume I and II Gangulee, Das and Dutta latest edition. Central Education enterprises
2. Cryptogamic Botany Volume I and II by G M Smith McGraw Hill.
3. Genetics by Russel. Wesley Longman inc publishers.th(5 edition)
4. Plant Physiology by Taiz and Zeiger Sinauer Associates inc. publishers
5. Fundamentals of Ecology by E P Odum and G W Barrett. Thompson Asia Pvt Ltd. Singapore.
6. Cell Biology by De Robertis

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Scheme of Examinations

Internal and External Assessment as per CBSS of University of Mumbai

Note:

- Two short field excursions for habitat studies are compulsory.
  Field work of not less than eight hours duration is equivalent to one period per week for a batch of 15 students.
- A candidate will be allowed to appear for the practical examinations only if he/she submits a certified journal of F.Y.B.Sc. Botany or a certificate from the Head of the department / Institute to the effect that the candidate has completed the practical course of F.Y.B.Sc. Botany as per the minimum requirements. In case of loss of journal a candidate must produce a certificate from the Head of the department /Institute that the practicals for the academic year were completed by the student. However such a candidate will be allowed to appear for the practical examination but the marks allotted for the journal will not be granted.