The Kelkar Education Trust's

V G Vaze College of Arts, Science and Commerce

(Autonomous)

Syllabus for FYBSc

(June 2020 Onwards)

Program: B.Sc.

Semester I

Course Title: BOTANY

Course Code	Paper Title	Credit
SBO101	PLANT DIVERSITY I	2.0
SBO102	FORM AND FUNCTION I	2.0
SBOP101	PRACTICALS (101 & 102)	2.0

1. Syllabus as per Choice Based Credit System

i.	Name of the Programme	:	BOTANY
ii.	Course Code	:	SBO101
iii.	Course Title	:	PLANT DIVERSITY-I
iv.	Semester-wise Course Contents	:	Copy of the syllabus enclosed
v.	References and Additional References	:	Enclosed in the syllabus
vi.	Credit Structure		
	No. of Credits per Semester	:	02 + 01 = 03
vii.	No. of lectures per Unit	:	15
viii.	No. of lectures per week	:	03
ix.	No. of practical per week	:	02 (per batch)
2.	Scheme of Examination	:	60 Marks External assessment 40 Marks Internal Assessment
3.	Special notes, if any	:	No
4.	Eligibility, if any	:	As laid down in the college Admission brochure / website
5.	Fee structure	:	As per College fee structure specifications
6.	Special ordinances / Resolutions, if any	:	No

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Programme: F.Y.B.Sc **Semester**: I

Course: PLANT DIVERSITY I **Course code**: SBO101

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA) 40 marks					End Semester Examination	Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Written**	
3	-	1	2	20	15	05		-	60	100
Max. Time, End Semester Exam (Theory) -2Hrs.										

Course Objectives
To understand the classification, general characters of the classes of Algae, Fungi and Bryophytes.
To differentiate between the morphology, structure, life cycle and importance of the organisms of respective groups of plants.
To recognize the difference between various groups of Algae, Fungi and Bryophyte

COURSE CONTENT (SBO101)			
Unit No.	**Module no.**	**Content**	**Lectures**
1		**ALGAE**	**15**
	I	**General characters of Cyanophyta and Chlorophyta –** Distribution, Cell structure, pigments, reserve food, range of thallus, reproduction – vegetative, asexual and sexual reproduction, Alternation of generations	
	II	**Structure, life cycle and systematic position of *Nostoc* and *Spirogyra***	
	III	**Economic importance of Cyanophyta and Chlorophyta**	
2		**FUNGI**	**15**
	I	**Classification of Fungi up to classes proposed by G. M. Smith:** Phycomycetes, Ascomycetes, Basidiomycetes, Deuteromycetes	
	II	**General characters of Phycomycetes :** Occurrence, hyphal structure, reproduction, Alternation of generations	
	III	**Structure, life cycle and systematic position of *Rhizopus***	
		Economic importance of Phycomycetes : Fumaric acid, Oxalic acid, Citric acid production (Negative importance) : Neurites (Mucor pusillus)	
	IV	**Modes of nutrition in Fungi** : Saprophytism and Parasitism	
3		**BRYOPHYTA**	**15**
	I	**Classification of Bryophyta** Up to Classes	
	II	a. **General Account of Hepaticae** **b. range of sporophyte in Hepaticae**	
	III	***Riccia*** : Systematic Position, Structure and life cycle	
	IV	Economic importance of Hepaticae	

Course outcome
After the completion of the course, students will able to
CO1 To understand the salient features, their life cycle pattern with a suitable example; to be able to identify them.
CO2 know economic importance of various species of Algae, Fungi and Bryophytes and their applications for human kind
CO3 know more about the fascinating world of plants which will enhance their interest for the subject.

Recommended Resources	
Text Books	1. Golatkar V.V., Patel B.B., Tutakne N.S. A New Course in Botany, FYBSc, Semester I & II, Sheth Publications, Mumbai. 2. Botany-I, Plant Diversity, F.Y.B.Sc., Semester I.Tech-Max Publications, Pune.
Reference Books	1. Kumar, H.D. and H. N. Singh (1971) Textbook of Algae 2. Sharma, O.P. (1986) Textbook of Algae 3. Pandey, B. P. (1994) Textbook of Botany – Algae 4. Vashista, B. R. (1995) Botany for degree students-Algae 5. Alexopoulos, C.J. and C. W. Mims (1979) : Introductory Mycology 6. Sharma, O.O. (1989) : Textbook of Fungi 7. Gangulee, H.S. and A. K. Kar (1992) : College Botany Vol. I 8. Parihar, N. S. (1959) : An introduction to Embryophyta. Bol. I –Bryophyta 9. Ram Udar (1976) : Bryology in India 10. Smith, G. M. (1955) :Cryptogamic Botany Bol. II 6. 11. Watson, E.V, (1964) : The Structure and life of Bryopytes 12. Vashista, B.R. (1996) : Botany for degree students -Brtophyta 13. Chopra, R. N. and P. K. Kumra (1988) : Biology of Bryophytes.

1. Syllabus as per Choice Based Credit System

i.	Name of the Programme	:	BOTANY
ii.	Course Code	:	SBO102
iii.	Course Title	:	FORM AND FUNCTION-II
iv.	Semester-wise Course Contents	:	Copy of the syllabus enclosed
v.	References and Additional References	:	Enclosed in the syllabus
vi.	Credit Structure		
	No. of Credits per Semester	:	02 + 01 = 03
vii.	No. of lectures per Unit	:	15
viii.	No. of lectures per week	:	03
ix.	No. of practical per week	:	02 (per batch)
2.	Scheme of Examination	:	60 Marks External assessment 40 Marks Internal Assessment
3.	Special notes, if any	:	No
4.	Eligibility, if any	:	As laid down in the college Admission brochure / website
5.	Fee structure	:	As per College fee structure specifications
6.	Special ordinances / Resolutions, if any	:	No

Programme: F.Y.B.Sc. **Semester**: I

Course: FORM AND FUNCTION II **Course code**: SBO102

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA) 40 marks					End Semester Examination	Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Written**	
3	-	1	2	20	15	05		-	60	100
Max. Time, End Semester Exam (Theory) -2Hrs.										

Course Objectives
To understand the structure and functions of cell wall, plasma membrane, Chloroplast and Endoplasmic reticulum.
To understand the phenomenon of inheritance of genetic traits.
To recognize the importance of Ecosystem, biotic and abiotic factors of various ecosystems, interactions taking place in the ecosystem and flow of Energy and Energy models.

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COURSE CONTENT (SBOP102)			
Unit No.	**Module no.**	**Content**	**Lectures**
1		**CELL BIOLOGY**	**15**
	I	**Cell :** Structure of Prokaryotic and Eukaryotic Cell **General structure of plant cell:** Ultra structure of Cell wall and its functions	
	II	Ultra structure of Plasma membrane (lipid bilayer structure, fluid mosaic model) and its functions with respect to transport of ions across cell membranes, active and passive transport, importance of carriers, channels and pumps	
	III	Ultra structure of chloroplast and its functions	
	IV	Ultra-structure and function of Endoplasmic reticulum.	
2		**ENVIRONMENTAL SCIENCE**	**15**
	I	Types of ecosystems: i. Aquatic (Freshwater- Lentic, Lotic, Marine ecosystem – Ocean, Estuarine) ii. Terrestrial (Forest, Grassland, Desert,Cropland)	
	II	Types of Ecological pyramids : Pyramid of Biomass, Pyramid of number, Pyramid of Energy)	
	III	Energy flow in an ecosystem with help of energy flow models	
3		**GENETICS**	**15**
	I	Phenotype/Genotype, Mendelian Genetics- monohybrid, dihybrid; test cross; back cross ratios.	
	II	Epistatic and Non-epistatic interactions; multiple alleles	

Course outcome
After the completion of the course, students will able to
CO1 Understand importance of the cell wall, Plasma membrane, Chloroplast and Endoplasmic Reticulum,
CO2 Basic genetic Inheritance patterns
CO3 Understand the concept of Food chain, Energy flow and types of Ecosystems

Recommended Resources	
Text Books	1. Golatkar V.V., Patel B.B., Tutakne N.S. A New Course in Botany, FYBSc, Semester I & II, Sheth Publications, Mumbai. 2. Botany-II Form and Function I, F.Y.B.Sc., Semester I. Tech-Max Publications, Pune.
Reference Books	• C. B. Powar – 1992 : Cell Biology; Himalaya Publishing House. • Swanson, C. P. 1968. Cytology and Cytogenetics. Macmillan and Co. Ltd., London. • Sharma, A. K. and Sharma, A. 1980. Chromosome techniques- Theory and practice. Butterworth and Co. (Publishers) Ltd., London. • Karp Gerald. 2015 Cell and Molecular Biology. Global Publications. • Russell P. J. 1998. Genetics (Fifth edition) Benjamin / Cummings Publishing Company Canada • Ecology workbook – R. Misra • Plant Ecology – Weaver and Clemests • Principles of environmental Biology – P.K. Nair, 1979 • Fundamentals of Ecology – E.P. Odum, 1996 • Ecology – E. P. Odum. • Ecology and Environment – P. D. Sharma, Rastogi publications, Meerut • Concept of Ecology (Environmental Biology) - P. S. Verma, V. K. Agarwal, S. Chand and Company Ltd. New Delhi.

Practical	PLANT DIVERSITY I	SBOP101
Sr. No.	**Description**	
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: *Anabaena* (Nitrogen fixation) , *Spirulina* (Neutraceutical), *Ulva* (Biofuel), *Chlorella* (Protein)	
4	Study of stages in the life cycle of *Rhizopus* from fresh/ preserved material and permanent slides.	
5	Economic importance of Fungi: Mushroom, Yeast, wood rotting fungi (any bracket fungus).	
6	Study of stages in the life cycle of *Riccia* with the help of permanent slides	
7	Types of Sporophytes in Hepaticae with the helpof Permanent slides or photomicrographs.	

Practical	FORM AND FUNCTION I	SBOP101
Sr. No.	**Description**	
1	Grams staining of bacteria	
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 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*)	
6	Xerophytes : Succulent (*Opuntia*); Woody Xerophyte (*Nerium*); Halophyte (*Avicennia* pneumatophore)	
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* .	

Dr. Aparna Saraf
(VC Nominee)

Syllabus Prepared by:

1. Dr. M. A. Deodhar: Chairperson, Syllabus Committee Head, Dept of Botany, V G Vaze College, Mulund East, Mumbai
2. Dr. S. L. Dhuri: Member, Syllabus Committee Associate Professor, Dept. of Botany, V G Vaze College, Mulund East, Mumbai
3. Dr. Ajit Kengar: Member, Syllabus Committee Associate Professor, Dept. of Botany, V G Vaze College, Mulund East, Mumbai
4. Dr. Supryia Thale: Member, Syllabus Committee Assistant Professor, Dept. of Botany, V G Vaze College, Mulund East, Mumbai
5. Mr. Jatin Vaity : Member, Syllabus Committee Assistant Professor, Dept. of Botany, V G Vaze College, Mulund East, Mumbai

Topics added in the syllabus

Changes made as per suggestions made by BOS

Dr. Aparna Saraf
(VC Nominee)