

# **VIDYASAGAR UNIVERSITY**

Midnapore, West Bengal



*PROPOSED CURRICULUM & SYLLABUS (DRAFT) OF*

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## **BACHELOR OF SCIENCE (HONOURS) MAJOR IN BOTANY**

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**4-YEAR UNDERGRADUATE PROGRAMME**

*(w.e.f. Academic Year 2023-2024)*

*Based on*

**Curriculum & Credit Framework for Undergraduate Programmes**

**(CCFUP), 2023 & NEP, 2020**

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VIDYASAGAR UNIVERSITY, PASCHIM MIDNAPORE, WEST BENGAL

**VIDYASAGAR UNIVERSITY**  
**BACHELOR OF SCIENCE (HONOURS) MAJOR IN BOTANY**  
**(under CCFUP, 2023)**

Level	YR.	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks			
								CA	ESE	TOTAL	
B.Sc. (Hons.)	1 <sup>st</sup>	I	<b>SEMESTER-I</b>								
			Major-1	BOTHMJ101	T: Plants and Microbial Diversity and its Evolution P: Practical	4	3-0-1	15	60	75	
			SEC	BOTSEC01	P: Biofertilizers	3	0-0-3	10	40	50	
			AEC	AEC01	Communicative English -1 ( <i>common for all programmes</i> )	2	2-0-0	10	40	50	
			MDC	MDC01	Multidisciplinary Course -1 ( <i>to be chosen from the list</i> )	3	3-0-0	10	40	50	
			VAC	VAC01	ENVS ( <i>common for all programmes</i> )	4	2-0-2	50	50	100	
			Minor (Disc.-I)	BOTMI01	T: Plant Science-I ( <i>To be taken by students of other Disciplines</i> ) P: Practical	4	3-0-1	15	60	75	
		<b>Semester-I Total</b>						20			400
		II	<b>SEMESTER-II</b>								
			Major-2	BOTHMJ102	T: Morphology, Anatomy and Plant Taxonomy P: Practical	4	3-0-1	15	60	75	
			SEC	BOTSEC02	P: Floriculture	3	0-0-3	10	40	50	
			AEC	AEC02	MIL-1 ( <i>common for all programmes</i> )	2	2-0-0	10	40	50	
			MDC	MDC02	Multi Disciplinary Course-02 ( <i>to be chosen from the list</i> )	3	3-0-0	10	40	50	
			VAC	VAC02	Value Added Course-02 ( <i>to be chosen from the list</i> )	4	4-0-0	10	40	50	
			Minor (Disc.-II)	BOTMI02	T: Plant Science-II ( <i>To be taken by students of other Disciplines</i> ) P: Practical	4	3-0-1	15	60	75	
			Summer Intern.	CS	Community Service	4	0-0-4	-	-	50	
		<b>Semester-II Total</b>						24			400
		<b>TOTAL of YEAR-1</b>						44			800

MJ = Major, MI = Minor Course, SEC = Skill Enhancement Course, AEC = Ability Enhancement Course, MDC = Multidisciplinary Course, VAC = Value Added Course; CA= Continuous Assessment, ESE= End Semester Examination, T = Theory, P= Practical, L-T-P = Lecture-Tutorial-Practical, MIL = Modern Indian Language, ENVS = Environmental Studies

VIDYASAGAR UNIVERSITY, PASCHIM MIDNAPORE, WEST BENGAL

MINOR (MI)

**MI – 1: Plant Science-I**

**Credits 04 (Full Marks: 75)**

**MI – 1T: Plant Science-I**

**Credits 03**

**[45L]**

**Course contents:**

UNIT	Topic	No. of Lectures
1	<b>Introduction to microbial world-</b> Whittaker's five-kingdom system <b>Virus:</b> General characteristics, classification (Baltimore), Economic importance. <b>Bacteria:</b> General characteristics, Bergey's Classification, Economic importance. <b>Algae:</b> General characteristics; habitat, classification (Van Den Hoek, 1995), lifecycle patterns of <i>Volvox</i> and <i>Batrachospermum</i> , Economic importance. <b>Fungi:</b> General characteristics, Classification (Ainsworth, up to Order), life cycle patterns of <i>Rhizopus</i> and <i>Agaricus</i> , economic importance. Brief account of lichen and mycorrhiza.	15
2	<b>Bryophytes:</b> General characteristics, classification (Proskauer, 1957), morphology, anatomy and reproduction of <i>Riccia</i> , <i>Anthoceros</i> and <i>Funaria</i> , economic importance of bryophytes. <b>Pteridophytes:</b> General characteristics, Classification (Sporne, 1975), morphology, anatomy and reproduction of <i>Lycopodium</i> , <i>Adiantum</i> and <i>Marsilea</i> . Economic importance	15
3	<b>Gymnosperms:</b> General characteristics, Classification (Sporne, 1965), morphology, anatomy and reproduction of <i>Cycas</i> and <i>Pinus</i> . Economic importance. <b>Paleobotany:</b> Geological time scale and important events, Types of plant fossils.	15

**MI – 1P: Plant Science-I (Practical)**

**Credits 01**

**Course Outline**

1. Electron micrographs/Models of viruses – T-Phage and Sars-CoV2.
2. Study of Curd organisms through Gram staining.
3. Study of vegetative and reproductive structure of *Volvox*, and *Batrachospermum*.
4. Study of morphology and reproductive structure of *Rhizopus* and *Agaricus*.
5. Study of morphology of thallus and reproductive structure of *Riccia*, *Anthoceros* and *Funaria*.
6. Study of morphology vegetative and reproductive structure of *Lycopodium*, *Adiantum* and *Marsilea*.
7. Study of morphology and vegetative structure of *Cycas* and *Pinus*.
8. Study of fossil types (impressions, compressions, petrification).

## SKILL ENHANCEMENT COURSE (SEC)

**SEC 1: Biofertilizers**

**Credits 03**

**SEC1P: Biofertilizers**

**Full Marks: 50**

### **Course Outline:**

**Unit- 1:** General account about the microbes used as biofertilizer – Rhizobium – isolation, identification, mass multiplication, carrier based inoculants, Actinorrhizal symbiosis.

**Unit- 2:** *Azospirillum*: isolation and mass multiplication – carrier based inoculant, associative effect of different microorganisms. *Azotobacter*: classification, characteristics – crop response to *Azotobacter* inoculum, maintenance and mass multiplication.

**Unit- 3:** Cyanobacteria (blue green algae), *Azolla* and *Anabaena azollae* association, nitrogen fixation, factors affecting growth, blue green algae and *Azolla* in rice cultivation.

**Unit- 4:** Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield – colonization of VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.

**Unit-5:** Organic farming – Green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes – biocompost making methods, types and method of vermicomposting – field Application.

### **Suggested Readings:**

1. Dubey, R.C., 2005 A Text book of Biotechnology, S. Chand & Co, New Delhi.
2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.
3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay Publication, New Delhi.
4. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers.
5. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New \_Delhi.
6. Vayas,S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic \_Farming Akta Prakashan, Nadiad