

DEBRA THANA S.K.S. MAHAVIDYALAYA (AUTONOMUS)

Chakshyampur , Debra, Paschim Medinipur, West Bengal



PROPOSED CURRICULUM & SYLLABUS (DRAFT) OF

BACHELOR OF SCIENCE (HONOURS)

MAJOR IN BOTANY

4-YEAR UNDERGRADUATE PROGRAMME

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

Based on

**Curriculum & Credit Framework for Undergraduate
Programmes(CCFUP), 2023 & NEP, 2020**

**DEBRA THANA SAHID KSHUDIRAM SMRITI
MAHAVIDYALAYABACHELOR 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 st	I	SEMESTER-I								
			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 Group and Taxa -I (<i>To be taken by students of other Disciplines</i>) P: Practical	4	3-0-1	15	60	75	
		Semester-I Total						20			400
		II	SEMESTER-II								
			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 Morphology and Taxonomy -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	
		Semester-II Total						24			400
		TOTAL of YEAR-1						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

BOTANY 4 YRS SYLLABUS

MINOR (MI)

MI – 1: Plant Groups and Taxa

Credits 04 (Full Marks: 75)

MI – 1T: Plant Groups and Taxa

Credits 03 [45L]

Course contents:

UNIT	Topic	No. of Lectures
1	Introduction to microbial world- Whittaker's five-kingdom concept. Virus: General characteristics, Life cycle of Virus; Structure of TMV virus ; Structure of Bacteriophage ; Classification of Virus (Baltimore 1971) ; Economic importance. Bacteria: General characteristics; Bergey's manual revised Classification ; Economic importance. Algae: General characteristics ; habitat ; Vegetative structure and Life cycle patterns of <i>Polysiphonia</i> , <i>Oedogonium</i> and <i>Vaucheria</i> ; Economic importance. Fungi: General characteristics ; Classification (Ainsworth's 1973, up to Order); Life cycle patterns of <i>Rhizopus</i> and <i>Agaricus</i> ; Economic importance; Brief account of Lichen and Myxomycetes ; Mycorrhiza ; types and application .	15
2	Bryophytes: General characteristics, classification (Proskauer, 1957); Economic importance ; morphology, anatomy and life cycle of <i>Riccia</i> , <i>Marchantia</i> and <i>Funaria</i> ; Economic importance of bryophytes. Pteridophytes: General characteristics, Classification (Sporne, 1975), morphology, anatomy and life cycle of <i>Selaginella</i> , <i>Lycopodium</i> and <i>Marsilea</i> ; Economic importance	15
3	Gymnosperms: General characteristics, Classification (Sporne, 1965), morphology, anatomy and life cycle of <i>Cycas</i> and <i>Pinus</i> ; Economic importance. Paleobotany: 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 HIV .
2. Study of Curd organisms through Gram staining.
3. Study of vegetative and reproductive structure of *Oedogonium* , *Polysiphonia* , and *Vaucheria*.
4. Study of morphology and reproductive structure of *Rhizopus* and *Agaricus*.
5. Study of morphology of thallus and reproductive structure of *Riccia* , *Marchantia* and *Funaria*.
6. Study of morphology vegetative and reproductive structure of *Selaginella*, *Marsilea* and *Lycopodium*.
7. Study of morphology and reproductive structure of *Cycas* and *Pinu*.
8. *Field visit*.

MI-2: Plant Morphology and Taxonomy.

Credits 04 (Full Marks: 75)

MI-2T: Plant Morphology and Taxonomy

Credits 03

[45L]

Course contents:

UNIT	Topic	No. of Lectures
1	Plant morphology- Types and modification of Roots, Stem and Leaves .	3
2	Flower- Inflorescences; types , Floral parts , Aestivation, Placentation , Floral formula, Floral diagram.	4
3	Fruits and Seeds ; types and dispersal	2
4	Plants systematics ; <i>Hierarchy, concept of taxa , species concept , principle and rules of ICN, Nomenclature, Author citation, valid and effective publication ,Herbarium and Botanical Garden- concept and importance ;</i> Brief concept about flora ,monographs ;Keys single and multi access.	5
5	Systems of classification, Overview of artificial, natural and phylogenetic classification; Classification system of Bentham and Hooker (up to series). Brief account of Angiosperm Phylogeny Group classification(APG); concept of basal angiosperm and eudicots; monophyly, polyphyly , phylogenetic tree, cladogram, dendrogram .	4
6	General descriptions of the given families:- Malvaceae, Fabaceae , Acanthaceae, Solanaceae , Asteraceae, Poaceae, Orchidaceae .	4

MI-2P: Plant Morphology and Taxonomy II (Practical)

Credits 01

Course Outline:

1. Study of leaf types.
2. Study of inflorescence types.
3. Study of fruit types:
Berry: *Cucumis sativus, Capsicum annum, Solanum melongena*
Drupe: *Mangifera indica, Borasus flaballifer*
Hesperidium: *Citrus*
Nut: *Arachis hypogea*
4. Study of vegetative and floral characters of the following families
Malvaceae – *Sida* sp. / *Abutilon* sp / *And locally available species* .
Acanthaceae – *Ruellia* sp./*Barleria*
Fabaceae – *Tephrosia* sp./*Crotalaria* sp.
Solanaceae – *Solanum* / *Datura* / *and locally available sp.*
5. *Herbarium preparation.*

6. Field visit

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 – colonization , isolation and inoculum production 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 types making methods; vermicomposting methods field Application.

Unit -6:- Field visit .

Suggested Reading :

1. Dupey , R.C, 2005 A Text book of Bio technology , S. Chand and Co, New Dehli.
2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.

SEC 2: Floriculture

Credits 03

SEC 2P: Floriculture

Full Marks: 50

Course Outline:

UNIT-1: Introduction: History of gardening; Importance and scope of floriculture and landscape gardening.

UNIT-2: Nursery Management and Routine Garden Operations: Sexual and vegetative methods of propagation; Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading; Stopping or pinching; Defoliation; Wintering; Mulching; Topiary; Role of plant growth regulators.

UNIT-3: Ornamental Plants: Flowering annuals; Herbaceous perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads and Ferns and Cultivation of plants in pots; Indoor gardening; Bonsai.

UNIT-4: Principles of Garden Designs: English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds, Shrubbery, Borders, Water garden. Some Famous gardens of India.

UNIT-5: Landscaping Places of Public Importance: Landscaping highways and Educational institutions and sports ground .

UNIT-6: Commercial Floriculture: Factors affecting flower production; Production and packaging and marketing of cut flowers; Flower arrangements; Methods to prolong vase life; Cultivation of Important cut flowers (Polyanthus sp, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Liliium, Orchids).

UNIT-7: Diseases and Pests of Ornamental Plants.

UNIT -8: Field visit .

Suggested Readings:

1. Randhawa, G.S. and Mukhopadhyay, A. 1986. Floriculture in India. Allied Publishers.