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

Chakshyampur , Debra, Paschim Medinipur, West Bengal

PROPOSED CURRICULUM & SYLLABUS (DRAFT) OF

BACHELOR OF SCIENCE (GENERAL)

MAJOR IN BOTANY

3-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.)	1st		SEMESTER-I							
		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 (***common for all programmes***)	2	2-0-0	10	40	50
			MDC	MDC01	Multidisciplinary Course -1 (***to be chosen from the list***)	3	3-0-0	10	40	50
			VAC	VAC01	ENVS (***common for all programmes***)	4	2-0-2	50	50	100
			Major (Disc.-I)	BOTMJ01	**T: Plant Group and Taxa -I** ***(To be taken by students of other Disciplines)*** **P: Practical**	4	3-0-1	15	60	75
					Semester-I Total	20				400
			SEMESTER-II							
		II	Major-2	BOTHMJ102	**T: Morphology, 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 (***common for all programmes***)	2	2-0-0	10	40	50
			MDC	MDC02	Multi Disciplinary Course-02 (***to be chosen from the list***)	3	3-0-0	10	40	50
			VAC	VAC02	Value Added Course-02 (***to be chosen from the list***)	4	4-0-0	10	40	50
			Major (Disc.-II)	BOTMJ02	**T: Plant Morphology and Taxonomy -II** ***(To be taken by students of other Disciplines)*** **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 3 YRS SYLLABUS

MAJOR (MJ)

MJ – 1: Plant Groups and Taxa **Credits 04 (Full Marks: 75)**

MJ – 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 *Polysiphonia , Oedogonium and Vaucheria ;* Economic importance. **Fungi:** General characteristics ; Classification (Ainsworth's 1973, up to Order); Life cycle patterns of *Rhizopus* and *Agaricus*; 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 *Riccia* , Marchantia and *Funaria* ; Economic importance of bryophytes. **Pteridophytes:** General characteristics, Classification (Sporne, 1975), morphology, anatomy and life cycle of *Selaginella* , *Lycopodium* and *Marsilea*; Economic importance	15
3	**Gymnosperms:** General characteristics, Classification (Sporne, 1965), morphology, anatomy and life cycle of *Cycas* and *Pinus;* Economic importance. **Paleobotany:** Geological time scale and important events, Types of plant fossils.	15

MJ – 1P: Plant Group and Taxa-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 , *Marchentia* 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.*

MJ-2: Plant Morphology and Taxonomy. **Credits 04 (Full Marks: 75)**

MJ-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** *; Hierarchy, concept of taxa , species concept , principle and rules of ICN, Nomenclature, Author ciatation, valid and effective publication ,Herbariun and Botanical Garden- concept and importance* **;** 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

MJ-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 annuum*, *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; Cultivationof Important cut flowers (Polyanthus sp, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Lilium, 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.