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.)** | **1st** | **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 (***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** |
| **Minor****(Disc.-I)** | **BOTMI01** | **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** |
| **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 (***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** |
| **Minor****(Disc.-II)** | **BOTMI02** | **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 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. ofLectures |
| 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 |

# 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 , *Marchentia* and *Funaria.*
6. Study of morphology vegetative and reproductive structure of Selaginella, Marsilea and Lycopodium.

*,*

1. Study of morphology and reproductive structure of *Cycas* and *Pinu.*
2. *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. ofLectures |
| **1** | **Plant morphology**- Types and modification of Roots, Stem and Leaves . | 3 |
| **2** | **Flower**- Inflorescences; types , Floral parts , Aestivation, Placentation , Floralformula, 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 |
|  |  |  |

**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 annuum*, *Solanum melongena*

Drupe: *Mangifera indica*, *Borasus flaballifer*

Hesperidium: *Citrus*

Nut: *Arachis hypogea*

1. 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, 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.