VIDYASAGAR UNIVERSITY

Midnapore, West Bengal

PROPOSED CURRICULUM & SYLLABUS (DRAFT) OF

BACHELOR OF SCIENCE WITH BOTANY

(MULTIDISCIPLINARY STUDIES)

3-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
BACHELOR OF SCIENCE IN LIFE SCIENCES with BOTANY
(*Under CCFUP, 2023*)

Level	YR.	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
								CA	ESE	TOTAL
B.Sc. in Life Sc. with Botany	2nd	III	**SEMESTER-III**							
			Major-A2	BOTPMJ02	**T: Morpho-Anatomy and Taxonomy of Plants; P: Practical** *(To be studied by students taken Botany as Discipline- A)*	4	3-0-1	15	60	75
			Major-A3	BOTPMJ03	**T: Cell Biology; P: Practical** *(To be studied by students taken Botany as Discipline- A)*	4	3-0-1	15	60	75
			SEC	SEC03	*To be taken from SEC-03 of Discipline C.*	3	0-0-3	10	40	50
			AEC	AEC03	Communicative English-2 (***common for all programmes***)	2	2-0-0	10	40	50
			MDC	MDC03	Multidisciplinary Course-3 (***to be chosen from the list***)	3	3-0-0	10	40	50
			Minor-3 (Disc.-C3)	BOTMIN03	**T: Plant Science-III; P: Practical** *(To be studied by students taken Botany as Discipline- C)*	4	3-0-1	15	60	75
					Semester-III Total	20				375
		IV	**SEMESTER-IV**							
			Major-B2		*To be decided* *(Same as MajorA2 for Botany taken as Discipline-B)*	4	3-0-1	15	60	75
			Major-B3		*To be decided* *(Same as Major–A3 for Botany taken as Discipline-B)*	4	3-0-1	15	60	75
			Major (Elective) -1	BOTMJE-01	**To be chosen from the given options** *(To be studied by students taken Botany as Discipline- A)*	4	3-0-1	15	60	75
			AEC	AEC04	MIL-2 (***common for all programmes***)	2	2-0-0	10	40	50
			Minor -4 (Disc.-C4)	BOTMIN04	**T: T: Plant Science-III; P: Practical** *(To be studied by students taken Botany as Discipline- C)*	4	3-0-1	15	60	75
			Summer Intern.	IA	Internship / Apprenticeship- **activities to be decided by the Colleges following the guidelines to be given later**	4	0-0-4	-	-	50
					Semester-IV Total	22				400
					TOTAL of YEAR-2	42	-	-	-	775

MJP = Major Programme (Multidisciplinary), MI = Minor, A/B = Choice of Major Discipline; C= Choice of Minor Discipline; SEC = Skill Enhancement Course, AEC = Ability Enhancement Course, MDC = Multidisciplinary Course, CA= Continuous Assessment, ESE= End Semester Examination, T = Theory, P= Practical, L-T-P = Lecture-Tutorial-Practical, MIL = Modern Indian Language

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MAJOR (MJ)

MJ A2/B2: Morpho-Anatomy and Taxonomy of Plants **Credits 04 (FM: 75)**

MJ A2/B2T: Morpho-Anatomy and Taxonomy of Plants **Credits 03 [45L]**

Course contents:

Unit	Topic	Lectures/ Hrs
1	**Plant morphology**- A general account of root, stem & leaves of monocot and dicot; phyllotaxy.	4
2	**Flower**- different types of inflorescences, **Aestivation**, Placentation - types; Floral formula, Floral diagram.	5
3	**Fruits & seeds**-types	4
4	**Structure and Development of Plant Body**: The three tissue systems, primary structure of root, stem, and leaf; types of stomata, Types of vascular bundles; Secondary growth in root and stem, Sapwood and heartwood; Ring and diffuse porous wood; Early and late wood; Annual ring; periderm and lenticels.	8
5	**Significance of Plant systematics**; Functions of Herbarium; Important herbaria and botanical gardens of the world and India; Brief concept about Flora, Monographs; Keys: Single access and Multi-access.	6
6	**Taxonomic hierarchy**, Concept of taxa (family, genus, species); Species concept (taxonomic, biological, evolutionary). Botanical nomenclature, Principles and rules (ICN); author citation, valid publication.	6
7	**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. Concept of primitive and Advance angiosperms (basal angiosperm and eudicots).	6
8	**General descriptions of the given families**: Malvaceae, Papilionaceae, Acanthaceae, Verbenaceae, Asteraceae, Poaceae.	6

MJ A2/B2P: Practical **Credits 01**

Course Outline:

1. Study of leaf types (Simple and Compounds).
2. Study of inflorescence types (recemose and cymose)
3. Study of floral diversity with special reference to adhesion and cohesion.
4. Study of fruit types:
   Berry: Cucumber, Capsicum, Brinjal
   Drupe: Mango, Borasus
   Hesperidium: Citrus
   Nut: ground nut
5. Study of vegetative and floral characters of the following families
   Malvaceae – *Sida* sp. / *Abutilon* sp.
   Acanthaceae – *Ruellia* sp./*Barleria* sp.
   Papilionaceae – *Tephrosia* sp./*Crotalaria* sp.
   Verbenaceae – *Lantana* sp./*Duranta* sp.

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MJ A3/B3: Cell Biology **Credits 04 (FM: 75)**

MJ A3/B3T: Cell Biology **Credits 03 [45L]**

Course contents:

Unit	Topic	lectures /Hours
1	**Cell as a unit of Life-** The Cell Theory; Prokaryotic and eukaryotic cells; Cell size and shape; Eukaryotic Cell components.	10
2	**Cell Organelles-** Structure and function of cell organelles: Chloroplast, Mitochondria, Ribosomes, Endoplasmic reticulum. **Cell Membrane and Cell Wall-** The functions of membranes; Models of membrane structure; The fluidity of membranes; Membrane proteins and their functions; Carbohydrates in the membrane; Faces of the membranes; Selective permeability of the membranes; Cell wall.	20
3	**Cell Cycle-** Overview of Cell cycle, Mitosis and Meiosis.Fundamental differences between mitosis and meiosis. Synaptonemal complex, mitotic spindle, significance of meiosis.	15

MJ A2/B2P: Practical **Credits 01**

Course Outline:

1. To study prokaryotic cells (bacteria), viruses, eukaryotic cells with the help of light and electron micrographs.
2. Study of the photomicrographs of cell organelles.
3. To study the structure of plant cell through temporary mounts.
4. Study of mitosis and meiosis (temporary mounts and permanent slides).
6. Study the effect of temperature, organic solvent on semi permeable membrane.
7. Demonstration of dialysis of starch and simple sugar.
8. Study of plasmolysis and deplasmolysis on Rhoeo leaf.
9. Measure the cell size (either length or breadth/diameter) by micrometry.

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MJ Elective-1: Herbal Technology **Credits 04 (FM: 75)**

MJE-1T: Herbal Technology **Credits 03 [45L]**

Course contents:

Unit	Topic	lectures /Hours
1	**Herbal medicines:** history and scope - definition of medical terms - role of medicinal plants in Siddha systems of medicine; cultivation - harvesting - processing - storage - marketing and utilization of medicinal plants.	10
2	**Pharmacognosy** - systematic position m edicinal uses of the following herbs in curing various ailments; Tulsi, Ginger, Fenugreek, Indian Goose berry and Ashoka.	15
3	**Phytochemistry** - active principles and methods of their testing - identification andutilization of the medicinal herbs; *Catharanthus roseus* (cardiotonic), *Withania somnifera* (drugs acting on nervous system), *Clerodendron phlomoides* (anti-rheumatic) and *Centella asiatica* (memory booster).	15
4	**Analytical pharmacognosy:** Drug adulteration - types, methods of drug evaluation -Biological testing of herbal drugs - Phytochemical screening tests for secondary metabolites (alkaloids, flavonoids, steroids, triterpenoids, phenolic compounds)	20

MJE-1P: Practical **Credits 01**

Course Outline:

Medicinal plant banks micro propagation of important species (Withania somnifera, neem and tulsi-Herbal foods-future of pharmacognosy).

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MINOR (MI)

(To be studied by students taken Botany as Discipline- C)

MI-3/C3: Same as Minor-3 (BOTMIN03) of Botany (Hons) programme — **Credits 04**, **Full Marks: 75**

MI-4/C4: Same as Minor-4 (BOTMIN04) of Botany (Hons) programme — **Credits 04**, **Full Marks: 75**

SKILL ENHANCEMENT COURSE (SEC)

(To be studied by students taken Botany as Discipline- C)

SEC-03 P: Same as SEC-03 (BOTSEC03) of Botany (Hons) programme — **Credits 03**, **Full Marks: 50**

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