MUGBERIA GANGADHAR MAHAVIDYALAYA
P.O.—BHUPATINAGAR, Dist.—PURBA MEDINIPUR, PIN.—721425, WEST BENGAL, INDIA
NAAC Re-Accredited B+Level Govt. aided College
CPE (Under UGC XII Plan) & NCTE Approved Institutions
DBT Star College Scheme Award Recipient
E-mail : mugberia_college@rediffmail.com // www.mugberiagangadharmahavidyalaya.ac.in

PROGRAMME OUTCOME (PO), COURSE OUTCOME (CO) AND PROGRAMME SPECIFIC OUTCOME (PSO) FOR END SEMESTER STUDENTS UNDER GRADUATE COURSE:2021

Programme Name: B.Sc. (BOTANY)

PROGRAMME OUTCOMES:

PO 1.	**Relevance of the Principles:** To understand the basic laws of nature, fundamental principles, and the scientific theories related to various phenomena and their relevance in the day-to-day life
P0 2	**Critical Thinking, Problem Solving Skills:** Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments. The skills of observations and drawing logical inferences from the scientific experiments.
P0 3.	**Develop Interdisciplinary Knowledge:** Realizing that knowledge of subjects in other branches such as humanities, performing arts, social sciences etc. can have greater influence and inspiration in evolving new scientific theories and inventions, and understanding the importance of interdisciplinary study in every walk of life
P0 4	**Moral and Ethical Values:** To imbibe ethical, moral and social values in personal and social life leading to highly cultured, civilized and responsible personality development.
P0 5	**Experimental learning and Employability options:** Analyzing the given scientific data critically and systematically and the ability to draw the objective conclusions. Acquire the knowledge with facts and figures related to various subjects in pure sciences such as Botany, Chemistry, Computer Science, Electronics, Mathematics, Physics, and Zoology etc.
P0 6	**Develop Research Related Skill:**Create, select, and apply appropriate techniques, resources, and modern instruments and equipments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations.
P0 7	**Communication skill and attitudes:** 1. Use of IT (word-processing, use of internet, statistical packages and databases). 2. Communication of scientific ideas in writing and orally. 3. Ability to work as part of a team. 4. Ability to use library resources. 5. Time management. 6. Career planning.

PROGRAMME SPECIFIC OUTCOME:

PSO 1: Procure updated and quality knowledge in the specialized areas of Botany.

PS0 2: Acquire practical skills in plant diversity and related topics

PS0 3: Identify plants applying classical and modern taxonomical skills.

PS0 4: Evolve entrepreneurial skills related to advanced fields of Botany.

PS0 5: Equip with various computational skills applied in the field of Bioinformatics.

PS0 6: Gain knowledge in organization of plants at gene, molecular, cellular and tissue level.

PSO7: Design and carryout biological experiments, projects and interpret data providing meaningful solutions

PS0 8: Beware of environmental issues and live-in harmony with nature.

PSO 9: Students able to start nursery, mushroom cultivation, biofertilizer production, fruit preservation and horticultural practices.

PSO 10: To know advance techniques in plant sciences like tissue culture, Phytoremediation, plant disease management, formulation of new herbal drugs .

Course Outcomes (CO) for End Semester Students: 2020-2021

CO/Course Code	Course Name	Core Course Outcome
CO1 DSC1A	**Biodiversity (Microbes, Algae, Fungi and Archegoniate)**	1. Identify various algae and understand the economic uses of algae,understand the structure and life cycle of different group of alge, classify different fungi based on morphology and reproduction, differentiate different lichens 2. Classify various bryophytes and understand their economic uses 3. The knowledge of origin, classification, stelar evolution and economic importance of Pteridophytes 4. The understanding of structure, reproduction and evolution of Pteridophytic order 5. Understand classification, general characters, distribution and phylogeny, economic importance of Gymnosperms. 6. Critically differentiate the characters of four orders of Gymnosperm i.e., Cycadales, Coniferales, Ginkgoales and Gnetales

CO2 DSC1B	Plant Ecology and Taxonomy	1. Analyze various types of ecosystems and correlate different ecosystems. 2. Know about how changes take place during ecological succession. 3. Understand the major systems of classification 4. Learn the botanical nomenclature, BSI and herbarium preparation 5. Understand the phylogeny of angiosperms and taxonomical evidence 6. Learn the diagnostic characters, economic importance, systematic and phylogeny of certain families
CO3 DSC1C	Plant Anatomy and Embryology	1. Understand various internal structures of the plant. 2. Secondary growth in plants

		3. Compare different types of embryo and endosperm development
CO4 DSC-1D	Plant Physiology and Metabolism	1. understand the water relations, absorption of water & minerals; stress mechanism 2. learn the photosynthesis and respiration; compare the C3, C4 and CAM cycles 3. understand the mechanisms of nitrogen fixation 4. learn the applications of growth regulators and their role in plant physiological activities 5. understand the concepts of thermodynamics and photobiology
CO5 DSE-1	Economic Botany and Biotechnology	1. Critically evaluate the advantages of tissue culture and horticulture over conventional

		methods of propagation. 2. Apply various horticultural practices in the field. 3. Experiment on the subject and try to become entrepreneurs. 4. Identify the economically important plants
CO6 DSE-2:	Genetics and Plant Breeding	1. Appreciate the facts behind heredity and variations. 2. Understand the basic principles of inheritance. 3. Solve problems related to classical genetics. 4. Predict the pattern of inheritance. 5. Understand various plant breeding techniques. 6. Realize the role of plant breeding in increasing crop productivity.
CO7 SEC1	Bio-fertilizers	1. Critically evaluate the advantages of organic farming. 2. Apply various biofertilizers in the field. 3. Experiment on the subject and try to become entrepreneurs.

CO8 SEC3	Floriculture	1. Critically evaluate the advantages of tissue culture and horticulture over conventional methods of propagation. 2. Apply various plant propagation practices in the field. 3. Experiment on the subject and try to become entrepreneurs. 4. Identify the ornamental plant
CO9 GE03	Economic Botany and Biotechnology	1. Critically evaluate the advantages of tissue culture and horticulture over conventional methods of propagation. 2. Apply various horticultural practices in the field. 3. Experiment on the subject and try to become entrepreneurs. 4. Identify the economically important plants
CO10 GE04	Plant Physiology and Metabolism	1. Know importance and scope of plant physiology. 2. Understand the plants and plant cells in relation to water. 3. Understand the process of photosynthesis in higher plants with particular

		emphasis on light and dark reactions, C3 and C4 pathways. 4. Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration. 5. Learn about the movement of sap and absorption of water in plant body 6. Understand the plant movements.

PO and CO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	average
CO1	3	1	2	1	2	2	1	1.71
CO2	3	3	3	3	2	2	1	2.43
CO3	3	3	3	3	2	3	1	2.57
CO4	3	3	3	3	2	3	1	2.57
CO5	3	3	3	3	2	3	1	2.57
CO6	3	3	3	3	2	3	1	2.57
CO7	3	3	3	3	2	3	1	2.57
CO8	3	3	3	3	2	3	1	2.57
CO9	3	3	3	3	2	3	1	2.57
CO10	3	3	3	3	2	3	1	2.57

Mapping Correlation

3	2	1
High	**Medium**	**Low**

Attainment of Course Outcomes & Programme Outcomes

In the Outcome Based Education (OBE), assessment is done through one or more than one processes, carried out by the department, that identify, collect, and prepare data to evaluate the achievement of course outcomes (CO's).
The process for finding the attainment of Course outcomes uses various tools/methods. These methods are classified into two types: **Direct and Indirect methods.**

Direct methods display the student's knowledge and skills from their performance in the class/assignment test, internal assessment tests, assignments, semester examinations, seminars, projects, etc. These methods provide a sampling of what students know and/or can do and provide strong evidence of student learning.

Indirect methods such as course exit survey and examiner feedback to reflect on student's learning. They are used to assess opinions or thoughts about the graduate's knowledge or skills.

Following tables show the various methods used in assessment process that periodically documents and demonstrates the degree to which the Course Outcomes are attained. They include information on:

a) Listing and description of the assessment processes used to gather the data.
b) The frequency with which these assessment processes are carried out.

Table 1 : Direct Assessment tool used for CO attainment

Sr. No.	Direct Assessment Method	Assessment frequency	Description
1.	Internal Assessment Test	Twice in a Semester	The Internal Assessment marks in a theory paper shall be based on two tests generally conducted at the end of 6^{th} and 11^{th} weeks of each semester. It is a metric used to continuously assess the attainment of course outcomes w.r.t course objectives. Average marks of two tests shall be the Internal Assessment Marks for the relevant course.

2.	Social Experiments	Frequently done in each Semester	Experiment is a qualitative performance assessment tool designed to assess students' practical knowledge and problem solving skills in society.
3.	End Semester Examination	Once in a Semester	End Semester examination (theory or projects) are the metric to assess whether all the course outcomes are attained or not framed by the course in charge. End Semester Examination is more focused on attainment of all course outcomes and uses a analytical questions.
4 .	Home Assignments	Frequently taken in a	Assignment is a metric used to assess student's analytical and problem solving abilities. Every student is assigned with course related tasks &
		Semester	assessment will be done based on their performance. Grades are assigned depending on their innovation in solving/deriving the problems.
5.	Class / Assignment Test	Twice in a Semester	It is a metric used to continuously assess the student understands capabilities.
6.	Presentations	As per the requirement	Presentation is the metric used to assess student's communication and presentation skills along with depth of the subject knowledge. Seminars topics are given to the students that cover topics of current interest or provide in-depth coverage of selected topics from the core courses.

7.	Class Attendance	As per Vidyasagar University Guideline.	Total 5 Marks allotted for every Course / SEC/ DSE/AECC or others. The marks obtained of every course from Class Attendance by the students is following manner. 05 Marks if he/ she attained greater than or equal to 95%. 04 Marks if he/ she attained greater than or equal to 90%. 03 Marks if he/ she attained greater than or equal to 85%. 02 Marks if he/ she attained greater than or equal to 80%. 01 Marks if he/ she attained greater than or equal to 75%.

Table 2: Indirect Assessment tool used for CO attainment

Sr. No.	**Indirect Assessment Method**	**Assessment frequency**	**Method Description**
1	Course Exit Survey / Students Feedback Survey	End of Semester	Collect variety of information about course outcomes from the students after learning entire course.

The weightages given for various assessment tools used for the attainment of Course Outcomes are shown in table 3.

Table 3: List of Course Assessment tools

			Tools	**Frequency**	**Weightage**
Assessment Tools	**Direct**	**Internal Tools**	Assignment or Class Test	Frequently taken in a semester	**10/75, 05/50**
			Internal Assessment	Twice in a semester	
			Home Assignments	Frequently given.	
			Mock Test or Surprise Test	Frequently done.	
			MCQ		

			Seminar/Presentations		
		External Tools	End Semester Examination	Once in a semester	**60/75(Theory paper),** **40/60(Theory paper),** **20/60(Practical Paper)**
		Class Attendance	Counted after completion the End Semester classes.	Once in a semester	Total 5 Marks allotted for every Course / SEC/ DSE/AECC or others. The marks obtained of every course from Class Attendance by the students is following manner. 05 Marks if he/ she attained greater than or equal to 95%. 2.04 Marks if he/ she attained greater than or equal to 90%. 3.03 Marks if he/ she attained greater than or equal to 85%. 4.02 Marks if he/ she attained greater than or equal to 80%. 5.01 Marks if he/ she attained greater than or equal to 75%.

DIRECT METHOD

Academic Session: 2020-21

Semester VI

Programme Name: B.Sc.General (Botany)

ATTAINMENT LEVELS FOR

Target Level	Level Description/ Marks student scoring	
1	Below 40%	50 → indicates % and above in the questions in Internal and External tests
2	Below 40%-49%	
3	50% & about	

DIRECT METHOD

Academic Session: 2020-21

Semester VI

Programme Name: B.Sc.General (Botany)

ATTAINMENT LEVELS FOR

Target Level	Level Description/ Marks student scoring	
1	Below 40%	50 → indicates % and above in the questions in Internal and External tests
2	Below 40%-49%	
3	50% & about	

Botany Outgoing Students -2021

Sl.no.	Year of passing	B.Sc. GENERAL BIO	Roll no	Result
1.	2021	Sobhana Jana	340	CGPA: 10.00
2.	,,	Abhijit Das	339	CGPA: 9.10
3.	,,	Debanjana Mishra	321	CGPA: 9.40
4.	,,	Debasish Maity	335	CGPA: 9.70
5.	,,	Debika Jana	281	CGPA: 9.70
6.	,,	Krishna Gopal Guchhait	283	CGPA: 10.00
7.	,,	Moumita Maity	286	CGPA: 9.10
8.	,,	Piu Samanta	311	CGPA: 9.40
9.	,,	Rinki Bera	297	CGPA: 10.00
10.	,,	Santu Maity	347	CGPA: 9.10
11.	,,	Sayan Giri	331	CGPA: 9.70
12.	,,	Snehasish Santra	300	CGPA: 9.10
13.	,,	Srabani Das	947	CGPA: 9.10
14.	,,	Subham Patra	302	CGPA: 10.00
15.	,,	Sudip Giri	299	CGPA: 9.40

Mugberia Gangadhar Mahavidyalaya ESTD.-1964 Purba Medinipur Bhupatinagar

Principal
Mugberia Gangadhar Mahavidyalaya