BARASAT GOVT COLLEGE

POST GRADUATE DEPARTMENT OF BOTANY

B.Sc. Botany (Hons) CBCS Syllabus

With effect from 2018-19

Program Outcome (PO)

PO 1	Scientific reasoning
PO 2	Disciplinary knowledge
PO 3	Analytical reasoning
PO 4	Critical thinking
PO 5	Cooperation/Team work
PO 6	Research-related skills
PO 7	Information/digital literacy:
PO 8	Self-directed learning
PO 9	Problem solving

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POST GRADUATE DEPARTMENT OF BOTANY

B.Sc. Botany (Hons) CBCS Syllabus

With effect from 2018-19

Programme Specific Outcomes (PSO)

- PSO1: The undergraduate course in Botany (Honours) has been designed, keeping in pace with the new and emerging areas of plant science. After successfully completing the course, the students will obtain a resilient foundation in classical as well as contemporary aspects of plant science.

- PSO2: The courses are designed to build comprehensive knowledge regarding the nature and basic concepts of all the plant groups, their taxonomy, diversity, metabolism, biochemistry, genetics and other advanced interdisciplinary areas which will be fruitful for their future studies.

- PSO3: The courses included in the curriculum will also help the students in developing practical skills for handling of laboratory equipment's, collection, analysis and interpretation of scientific data (both field and laboratory data).

- PSO4: Since the programme also offers a wide range of elective courses (Discipline specific electives) to the students, skills learnt during the entire course will immensely help the students in solving practical as well as societal problems

- PSO5: The undergraduate course in Botany also opened many career opportunities like a career in academia or industry.

- PSO6: This grounding in the subject equipped them to pursue extensive research project in future.

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-1

Course Code: BOTACOR01T & BOTACOR01P

Topic Name: PHYCOLOGY AND MICROBIOLOGY

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Acquired knowledge about the general structure, ultrastructure and activities of the viruses, different prokaryotic organisms	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO2	Learned the beneficial roles of algae, bacteria and viruses as well as the harmful and detrimental effect of these organisms on human	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO3	Understand about the diversity, phylogeny interrelationships and evolution of the viruses, algae and bacteria and their roles in triggering	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO4	Acquainted with the practical knowledge on Models of viruses, bacteria, Gram staining of bacteria, endospore etc.	L3 Applying	1,2,3,4,6,8	1,2,3,4,5,6
CO5	Learned to prepare media, sterilization and plating techniques to culture micro-organisms.	L6 Creating	1,2,3,4,6,9	1,2,3,4,5,6
CO6	Explored different algal genera like Nostoc, Volvox, Oedogonium, Fucus, Polysiphonia from various classes of algae.	L3 Applying	1,2,3,4,6,8	1,2,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	2	2		2			2		1	2		2	1	2			
CO2	2	3	2	2		2		2			2	2		2	2	2			
CO3	2	3	2	2		2			2		2	2		2	2	2			
CO4	2	3	2	3		3		2			2	2	2	2	2	2			
CO5	3	3	2	3		2			1		3	3	2	3	2	3			
CO6	3	3	3	3		3		2			3	3		3	2	3			
Average	2.17	3.00	2.17	2.50		2.33		1.50	1.67		2.17	2.33	2.00	2.33	1.83	2.33			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-2

Course Code: BOTACOR02T & BOTACOR02P

Topic Name: BIOMOLECULES AND CELL BIOLOGY

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Familiarized with very basic aspects of cell biology and biomolecules.	L1 Remembering	1,2,3,4,6,8	1,2,4,5,6
CO2	Introduced to basic common arenas of life sciences such as basic cell structure, function and basic biochemical techniques.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO3	Augmented in respect to their vision and accepted for more complex courses based on this foundation.	L3 Applying	1,2,3,4,6,8	1,2,4,5,6
CO4	Demonstrated the qualitative and quantitative measurements of different biomolecules like carboydrates, proteins and lipids.	L3 Applying	1,2,3,4,6,9	1,2,3,4,5,6
CO5	Studied different plant cells like Rhoeo, Crinum and their measurement.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO6	Explored various cell organelles by electronmicrographs and observed stages of mitosis and meiosis, Feulgen staining of DNA etc.	L3 Applying	1,2,3,4,6,9	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1		2			1	2		1	1	2			
CO2	2	3	1	1		2			2		2	1		1	1	2			
CO3	2	3	2	2		2		2			2	2		3	2	2			
CO4	2	3	2	2		3			2		3	3	2	2	2	3			
CO5	3	3	2	2		3		2			3	3		3	2	3			
CO6	3	3	2	2		3			2		3	3	2	3	2	3			
Average	2.17	3.00	1.67	1.67		2.33		2.00	2.00		2.33	2.33	2.00	2.17	1.67	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-3

Course Code: BOTACOR03T & BOTACOR03P

Topic Name: MYCOLOGY AND PHYTOPATHOLOGY

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Able to understand fungi as most important eukaryotic microorganisms on earth, playing role in ecosystem processes,	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO2	Recognizable with general characteristics and diversity among different fungal group.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO3	Acquainted with diverse application of fungi in biotechnology, industry, agriculture and medical mycology.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO4	Demonstrated the symptoms, host- pathogen interactions, environmental relation and prevention of diseases in plants caused by	L3 Applying	1,2,3,4,6,9	1,2,3,4,5,6
CO5	Learned hands on training on Micrometry and study fungal genera from different classes like Rhizopus, Aspergillus, Penicillium, Ascobolus,	L2 Understanding	1,2,3,4,6,9	1,2,3,4,5,6
CO6	Compared different types of Lichens viz. crustose, foliose and fruticose types and mycorrhizae.	L3 Applying	1,2,3,4,6,9	1,2,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	2	3	1	1		2		2			1	2		3	1	2			
CO2	2	3	1	1		3		2			1	2		2	2	2			
CO3	2	3	2	2		2		2			3	2		3	2	2			
CO4	3	3	1	2		3			2		2	2	2	2	1	3			
CO5	3	3	2	3		2			2		3	3	2	3	2	3			
CO6	3	3	3	3		3			2		3	3		2	2	3			
Average	2.50	3.00	1.67	2.00		2.50		2.00	2.00		2.17	2.33	2.00	2.50	1.67	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-4

Course Code: BOTACOR04T & BOTACOR04P

Topic Name: CORE COURSE IV: ARCHEGONIATE

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Understand the origin and diversification of cryptogams and the importance of diseases caused by representative pathogens.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO2	Identify the diseases based on the symptoms and their control measures.	L3 Applying	1,2,3,4,6,8	1,2,4,5,6
CO3	Recognize different strategies of disease control with special reference to principles of plant viral disease management.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO4	Learn the practical knowledge on Lower plants like Bryophytes, Pteridophytes and Gymnosperms, their vegetative and reproductive	L2 Understanding	1,2,3,4,6,8	1,2,3,4,5,6
CO5	Study and compared Pteridophytic members like Psilotum, Selaginella, Equisetum, Pteris from permanent slides, specimens as well as fresh	L3 Applying	1,2,3,4,6,9	1,2,3,4,5,6
CO6	Develop the knowledge of Gymnosperms like Cycas, Pinus and Gnetum from permanent slides and jar specimens.	L3 Applying	1,2,3,4,6,9	1,2,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		2			1		1	1		2	1	2			
CO2	2	3	1	2		2		2			2	2		3	1	3			
CO3	2	3	2	2		3			2		2	2		2	1	2			
CO4	3	3	2	2		2		2			3	3	2	2	2	3			
CO5	3	3	3	3		3			2		3	3	2	3	2	2			
CO6	2	3	2	3		3			2		3	3		2	2	3			
Average	2.17	3.00	1.83	2.17		2.50		2.00	1.75		2.33	2.33	2.00	2.33	1.50	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-5

Course Code: BOTACOR05T & BOTACOR05P

Topic Name: MORPHOLOGY AND ANATOMY OF ANGIOSPERMS

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Comprehend different structural categories among the plants around us.	L3 Applying	1,2,3,4,6,8	1,2,4,5,6
CO2	Understand the relationships between internal and external structures of plants.	L2 Understanding	1,2,3,4,6,9	1,2,3,4,5,6
CO3	Acquire enough knowledge about our life sustainers.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO4	Learn about plant creatures and develop the feeling for plants which are essential for our survival.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO5	Gather impacts of anatomical and morphological features of plant to protect them.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO6	Demonstrate anatomical details of plant parts through permanent and temporary slides, and staining methods.	L3 Applying	1,2,3,4,6,9	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		2		1			1	1		2	1	2			
CO2	2	3	1	1		3			1		1	2	2	2	1	2			
CO3	3	3	2	2		2			2		3	3		3	1	2			
CO4	3	3	2	2		2		2			3	3		2	2	2			
CO5	2	3	3	3		3		3			3	3		3	2	3			
CO6	3	3	3	2		3			3		3	3	2	3	2	3			
Average	2.33	3.00	2.00	1.83		2.50		2.00	2.00		2.33	2.50	2.00	2.50	1.50	2.33			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
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HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-6

Course Code: BOTACOR06T & BOTACOR06P

Topic Name: ECONOMIC BOTANY

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Study the relationship between people (individuals and cultures) and plants around the world, encompassing the past, present and potential	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO2	Know the ways that people use plants as food, medicine etc.	L2 Understanding	1,2,3,4,6,8,	1,2,4,5,6
CO3	Learn different plants used as foods in different areas but also how they use the plant as food and also their history, origin, cultivation and	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO4	Understand about germplasm diversity and their importance.	L2 Understanding	1,2,3,4,6,9	1,2,3,4,5,6
CO5	Extract different plant products viz. tea, coffee, sugar etc. from the respective plants	L3 Applying	1,2,3,4,6,9	1,3,2,4,5,6
CO6	Describe different economically important plants belonging to Cereals, legumes, sugar yielding plants etc.	L3 Applying	1,2,3,4,6,9	1,2,4,5,6
	Learn the sources of oils and fats from plants	L1 Remembering	1,2,3,4,6,9	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		2		2			1	1		2	1	2			
CO2	1	3	1	2		2		2			2	2		2	1	2			
CO3	2	3	2	2		2		3			2	3		2	1	2			
CO4	2	3	2	3		2			2		3	2	2	3	2	2			
CO5	2	3	2	3		3			2		2	3	2	2	3	3			
CO6	3	3	3	2		3			3		3	2		3	3	3			
	3	3	3	2		3					2	3	2	3	3	3			
Average	2.00	3.00	2.00	2.14		2.43		2.33	2.33		2.14	2.29	2.00	2.43	2.00	2.43			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-7

Course Code: BOTACOR07T & BOTACOR07P

Topic Name: GENETICS

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Have a solid foundation in classical and modern molecular genetics as the focus is on understanding central principles and fundamental	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO2	Understand the modern concept of gene	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO3	Explore an understanding of transmission genetics (including linkage analysis), quantitative genetics and population genetics.	L3 Applying	1,2,3,4,6,8	1,2,4,5,6
CO4	Execute various stages of mitosis and meiosis from temporary and permanent slides.	L3 Applying	1,2,3,4,6,9	1,2,3,4,5,6
CO5	Learn the Mendelian ratio, laboratory exercises of chi square and probability tests.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Explore mapping of chromosomes, anomalies in genetics through permanent slides.	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		2		1			1	1		2	1	2			
CO2	1	3	1	2		2			1		2	2		2	1	2			
CO3	2	3	2	1		2		2			2	3		3	1	2			
CO4	2	3	2	3		3			2		3	3	2	3	2	3			
CO5	3	3	3	2		3	2				3	3	2	2	2	3			
CO6	3	3	3	3		3	3				3	3	2	2	2	3			
Average	2.00	3.00	2.00	2.00		2.50	2.50	1.50	1.50		2.33	2.50	2.00	2.33	1.50	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-8

Course Code: BOTACOR08T & BOTACOR08P

Topic Name: CORE COURSE VIII: MOLECULAR BIOLOGY

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Familiarize with very basic aspects of molecular biology.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO2	Understand the fundamental mechanism for the organization, replication, expression, variation, and evolution of the genetic material	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO3	Prepare Luria Bertini (LB) medium.	L6 Creating	1,2,3,4,6,7	1,2,3,4,5,6
CO4	Isolate DNA from plants sources, estimate DNA by qualitative and quantitive methods.	L6 Evaluating	1,2,3,4,6,7	1,2,3,4,5,6
CO5	Execute laboratory principles on RNA polymerases.	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Demonstrate the experiments of Griffith, Hershey &Chase, Conrat, Fraenkel, Stahl &Meselson and Avery etc.	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		2			2		2	2		1	1	2			
CO2	2	3	1	2		2			2		2	1		2	1	2			
CO3	2	3	3	2		2	1				1	3	2	3	1	3			
CO4	2	3	2	2		3	1				3	3	2	3	2	2			
CO5	3	3	2	3		3	2				3	3	2	3	2	3			
CO6	3	3	3	3		3	2				3	3	3	3	2	3			
Average	2.17	3.00	2.00	2.17		2.50	1.50		2.00		2.33	2.50	2.25	2.50	1.50	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-9

Course Code: BOTACOR09T & BOTACOR09P

Topic Name: PLANT ECOLOGY AND PHYTOGEOGRAPHY

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Understand the ecosystem and environment around us in detail.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO2	Study the landscape detail and it's vegetation composition at our local area as well as India as a whole.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO3	Learn the biodiversity and its conservation strategies.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO4	Boost the awareness for environment protection.	L3 Applying	1,2,3,4,6,8	1,2,4,5,6
CO5	Use the instruments needed to study abiotic factors of the environment.	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Measure carbondioxide, dissolved oxygen in collected water sample.	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		2		1			2	2		1	1	2			
CO2	1	3	3	1		2	2				1	1	2	2	1	2			
CO3	2	3	2	2		2			2		2	2		3	1	2			
CO4	3	3	3	3		3		2			2	3		2	2	3			
CO5	3	3	2	2		3	2				3	3	2	3	2	3			
CO6	3	3	3	3		3	3				3	3	2	3	2	3			
Average	2.17	3.00	2.33	2.00		2.50	2.33	1.50	2.00		2.17	2.33	2.00	2.33	1.50	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-10

Course Code: BOTACOR10T & BOTACOR10P

Topic Name: PLANT SYSTEMATICS

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Identify the plants with their local and global names.	L3 Applying	1,2,3,4,6,9	1,2,4,5,6,
CO2	Understand the diversity among the plants around us bearing flowers and fruits.	L2 Understanding	1,2,3,4,5,6,7	1,2,3,4,5,6
CO3	Study the distribution patterns and the availability of different groups of plants having ecological or economic values.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO4	Interact with Teachers to diverse plant specimens in an excursion which not only increases the theoretical knowledge but increase their	L3 Applying	1,2,3,4,5,6,7	1,2,3,4,5,6
CO5	Execute a positive impact towards the protection of our environment.	L3 Applying	1,2,3,4,6,9	1,2,4,5,6
CO6	Demonstrate the morphological characters in angiosperms to identify different families of flowering plants.	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		2			2		1	1		2	1	2			
CO2	2	3	1	2	2	3	1				1	2	2	3	1	2			
CO3	2	3	2	2		2		2			2	3		2	3	2			
CO4	3	3	2	3	3	3	2				3	2	3	3	3	3			
CO5	2	3	2	2		2			3		3	3		2	2	3			
CO6	3	3	3	3		3	3				3	3	2	3	3	3			
Average	2.17	3.00	1.83	2.17	2.50	2.50	2.00	2.00	2.50		2.17	2.33	2.33	2.50	2.17	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-11

Course Code: BOTACOR11T & BOTACOR11P

Topic Name: REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Identify the plants with their local and global names.	L3 Applying	1,2,3,4,6,8	1,2,4,5,6
CO2	Understand the reproductive development in plants, anther and pollen biology, ovule, pollination and fertilization.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO3	Explore the Knowledge in sexual reproduction in plants.	L3 Applying	1,2,3,4,6,8	1,2,4,5,6
CO4	Increase the knowledge of embryo, endosperm and seed.	L3 Applying	1,2,3,4,6,9	1,2,4,5,6
CO5	Develop hands on knowledge of anther, pollen, tapetum, both female and male gametophytes and embryogenesis.	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Execute the laboratory techniques to study anther, pollen, pollen viability.	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1		1			1	1		2	1	2			
CO2	1	3	2	2		3			1		2	1		2	1	2			
CO3	2	3	2	2		2		2			3	2		3	1	2			
CO4	3	3	3	3		3			2		2	3		3	2	3			
CO5	3	3	2	3		3	2				3	3	3	3	3	3			
CO6	3	3	3	2		3	2				3	3	3	2	3	3			
Average	2.17	3.00	2.17	2.17		2.50	2.00	1.50	1.50		2.33	2.17	3.00	2.50	1.83	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-12

Course Code: BOTACOR12T & BOTACOR12P

Topic Name: PLANT PHYSIOLOGY

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Improve The basic concepts of plant Physiology like water relation.	L3 Applying	1,2,3,4,6,9	1,2,4,5,6
CO2	Clear their concepts on transport of solute and ions in plants.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO3	Understand the Plant hormones, their chemical nature, biosynthesis and actions.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO4	Describe Phytochromes and blue light response in plants.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO5	Develop the knowledge on Transport of food through phloem etc.	L3 Applying	1,2,3,4,6,9	1,2,4,5,6
CO6	Determine the water potential, osmotic potential.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1			2		2	1		2	1	2			
CO2	1	3	1	1		2			2		1	1		2	1	2			
CO3	2	3	2	2		2	1				2	2	2	2	1	2			
CO4	3	3	2	3		3	2				3	3	2	3	2	3			
CO5	3	3	3	3		3			2		3	3		3	2	3			
CO6	3	3	3	3		3	3				3	3	2	3	2	3			
Average	2.17	3.00	2.00	2.17		2.33	2.00		2.00		2.33	2.17	2.00	2.50	1.50	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-13

Course Code: BOTACOR13T & BOTACOR13P

Topic Name: PLANT METABOLISM

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Learn metabolic activities taking place in plants and their relationship.	L2 Understanding	1,2,3,4,6	1,2,4,5,6
CO2	Develop the detailed concepts of photosynthesis and respiration.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO3	Understand the mechanism of ATP synthesis, bioenergetics.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO4	Acquire the knowledge of Signal transduction inplants, types and mechanism etc.	L2 Understanding	1,2,3,4,6	1,2,4,5,6
CO5	Isolate photosynthetic pigments and absorption spectra of these pigments.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Execute the effect of light intensity, carbon di oxide on the rate of photosynthesis.	L6 Creating	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1					1	1		2	1	2			
CO2	2	3	1	2		2	1				1	2	2	2	1	2			
CO3	1	3	2	2		2	2				2	2	2	2	2	2			
CO4	2	3	2	3		3					3	3		3	2	3			
CO5	3	3	3	3		3	2				3	3	2	3	2	3			
CO6	3	3	3	3		3	3				3	3	2	3	2	3			
Average	2.00	3.00	2.00	2.33		2.33	2.00				2.17	2.33	2.00	2.50	1.67	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Core Course-14

Course Code: BOTACOR14T & BOTACOR14P

Topic Name: PLANT BIOTECHNOLOGY

Course Outcome:

CO, PO & PSO Mapping				
Sl No	**Course outcome**	**Knowledge level Blooms Level**	**POs Mapping**	**PSOs mapping**
CO1	Learn metabolic activities taking place in plants and their relationship.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO2	Develop the detailed concepts of photosynthesis and respiration.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO3	Understand the mechanism of ATP synthesis, bioenergetics.	L2 Understanding	1,2,3,4,6,7	1,2,4,5,6
CO4	Acquire the knowledge of Signal transduction inplants, types and mechanism etc.	L2 Understanding	1,2,3,4,6,7	1,2,4,5,6
CO5	Isolate photosynthetic pigments and absorption spectra of these pigments.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Execute the effect of light intensity, carbon di oxide on the rate of photosynthesis.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1			3		1	1		2	1	2			
CO2	2	3	1	1		2			3		1	2		2	1	2			
CO3	2	3	2	2		2	1				2	2		2	2	2			
CO4	3	3	3	3		3	2				3	3		3	2	3			
CO5	3	3	3	3		3	2				3	3	2	3	2	3			
CO6	3	3	3	3		3	3				3	3	2	3	2	3			
Average	2.33	3.00	2.17	2.17		2.33	2.00		3.00		2.17	2.33	2.00	2.50	1.67	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Discipline Specific Elective-1

Course Code: BOTADSE01T

Topic Name: NATURAL RESOURCE MANAGEMENTS

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Understand different categories of resources around us and their uses.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO2	Apprehend the natural resources in a sustainable way protecting our environment and nature.	L4 Annalysing	1,2,3,4,6,8	1,2,4,5,6
CO3	Boost up the awareness for protection of our environment satisfying our needs as well	L4 Annalysing	1,2,3,4,6,9	1,2,4,5,6
CO4	Learn about the environmental rules and legislation and different environment-related issues.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO5	Estimate the solid waste generated in the domestic system.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Study of vegetation cover, data collection and identify the dominant woody species.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1		2			1	1		2	1	2			
CO2	1	3	1	1		2		2			2	2		2	1	2			
CO3	2	3	2	2		2			3		3	3		2	1	2			
CO4	2	3	2	2		3			3		2	2		3	2	3			
CO5	3	3	3	3		3	3				3	3	2	3	2	3			
CO6	3	3	3	3		3	3				3	3	2	3	2	3			
Average	2.00	3.00	2.00	2.00		2.33	3.00	2.00	3.00		2.33	2.33	2.00	2.50	1.50	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Discipline Specific Elective-2

Course Code: BOTADSE03T

Topic Name: INDUSTRIAL AND ENVIRONMENTAL MICROBIOLOGY

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Familiarize with different microbial industrial products-their formulation, processing and purification.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO2	Understand the general structure and function of different types of bioreactors (fermenters) and their controlling factors for industrial	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO3	Acquire the knowledge of different aspects of environmental microbiology to assess the quality of water, waste water management,	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO4	Know the principles and mechanism of functions of different instruments and can handle different instruments in microbiology	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6
CO5	Execute the sterilization techniques.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Learn preparation of culture media.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1		2			2	1		2	1	2			
CO2	1	3	1	2		1	2				1	2	2	2	1	2			
CO3	2	3	2	2		2			2		3	2		2	1	2			
CO4	2	3	3	3		3	2				3	3	2	3	2	3			
CO5	3	3	2	3		3	2				3	3	2	3	2	3			
CO6	3	3	3	3		3	2				3	3	2	3	2	3			
Average	2.00	3.00	2.00	2.33		2.17	2.00	2.00	2.00		2.50	2.33	2.00	2.50	1.50	2.50			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Discipline Specific Elective-3

Course Code: BOTADSE04T

Topic Name: ANALYTICAL TECHNIQUES IN PLANT SCIENCES

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Understand the mechanism of Imaging, Flow cytometry, FACS, FISH etc.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO2	Know the mechanism of Centrifugation, its types and various utility.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO3	Demonstrate the principles and uses of radioisotopes.	L3 Applying	1,2,3,4,6,8	1,2,4,5,6
CO4	Acquire the knowledge of Spectrophotometry its principles and significances.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO5	Obtain the knowledge of Biostatistics.	L2 Understanding	1,2,3,4,6,9	1,2,4,5,6
CO6	Acquainted with Blotting techniques, DNA fingerprinting, sequencing, PCR.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO7	Explore the techniques of paper chromatography, column chromatography, TLC etc.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1	2				1	1	2	2	1	2			
CO2	2	3	2	1		2		1			1	2		2	1	2			
CO3	1	3	1	2		3		2			2	2		2	1	3			
CO4	3	3	2	2		2		3			2	3		3	2	3			
CO5	3	3	2	2		3			2		3	3		2	2	3			
CO6	3	3	3	3		3	2				3	3	2	3	2	2			
CO7	3	3	3	3			2				3	3	2	2	2	2			
Average	2.29	3.00	2.00	2.00		2.33	2.00	2.00	2.00		2.14	2.43	2.00	2.29	1.57	2.43			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
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Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Discipline Specific Elective-4

Course Code: BOTADSE05T

Topic Name: BIOINFORMATICS

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Use data bases in biological sciences.	L3 Applying	1,2,3,4,6,7	1,2,3,4,5,6
CO2	Familiarize with biological sequence data bases like NCBI, search tools like BLAST, nucleotide and protein databases.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO3	Explore sequence alignments and molecular phylogeny.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6
CO4	Execute the significances of bioinformatics.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6
CO5	Search different databases available in the internet.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Determine sequence retrieval from data bases, alignment of the sequences.	L4 Annalysing	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1	1				1	2	1	2	1	2			
CO2	2	3	2	1		2	2				1	2	2	2	1	2			
CO3	2	3	2	2		3	2				2	2	2	2	1	2			
CO4	3	3	3	3		3	2				3	3	2	3	2	2			
CO5	3	3	3	3		3	3				3	3	2	3	2	3			
CO6	3	3	3	3		3	3				3	3	2	3	2	3			
Average	2.33	3.00	2.33	2.17		2.50	2.17				2.17	2.50	1.83	2.50	1.50	2.33			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Skill Enhancement Course-1

Course Code: BOTSSEC01M

Topic Name: PLANT DIVERSITY AND HUMAN WELFARE

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Understand biodiversity-kind and importance for us and our environment.	L2 Understanding	1,2,3,4,6,8	1,2,4,5,6
CO2	Realize how our environmental equilibrium Is lost silently with biodiversity.	L4 Annalysing	1,2,3,4,6,8	1,2,4,5,6
CO3	Learn much about biodiversity conservation that develops awareness about biodiversity conservation.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO4	Acquire the knowledge about the activities of different organizations in relation to environmental conservation like IUCN	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO5	Know in detail the utility and impacts of different plant products needed in our daily life.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6
CO6	Understand how plant diversity and sustainable development help the ethnic tribes.	L2 Understanding	1,2,3,4,6,7	1,2,3,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		3		2			1	1		2	1	1			
CO2	1	3	1	1		2		2			1	2		2	1	2			
CO3	2	3	2	1		2	1				2	2	1	2	1	2			
CO4	2	3	2	2		3	1				3	3	2	2	2	1			
CO5	3	3	3	2		2	2				3	3	2	3	1	2			
CO6	3	3	3	3		2	2				3	3	2	3	2	2			
Average	2.00	3.00	2.00	1.67		2.33	1.50	2.00			2.17	2.33	1.75	2.33	1.33	1.67			

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
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Under CBCS semester system
HONOURS COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Skill Enhancement Course-2

Course Code: BOTSSEC02M

Topic Name: ETHNOBOTANY

Course Outcome:

CO, PO & PSO Mapping

Sl No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
CO1	Generate a detailed idea regarding ethnobotany, an interdisciplinary s cience.	L4 Annalysing	1,2,3,4,6	1,2,4,5,6
CO2	Execute methods used in ethnobotany.	L4 Annalysing	1,2,3,4,6	1,2,4,5,6
CO3	Learn the role of ethnobotany in modern medicine.	L2 Understanding	1,2,3,4,6	1,2,4,5,6
CO4	Determine the relevance and significance of ethnobotany.	L4 Annalysing	1,2,3,4,6	1,2,4,5,6
CO5	Know about the utility of plant resources.	L2 Understanding	1,2,3,4,6	1,2,4,5,6
CO6	Know the interrelations of all the several traits and of the whole material and intellectual culture of a people in its entirety.	L2 Understanding	1,2,3,4,6	1,2,4,5,6

Program Articulation Matrix (CO-PO Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	1	3	1	1		1					1	1		2	1	2			
CO2	2	3	1	1		1					1	2		2	1	2			
CO3	1	3	1	2		2					2	2		2	1	2			
CO4	2	3	2	2		2					3	3		3	2	3			
CO5	2	3	3	3		3					3	3		3	2	3			
CO6	2	3	3	3		3					3	3		3	2	3			
Average	1.67	3.00	1.83	2.00		2.00					2.17	2.33		2.50	1.50	2.50			