

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-1  
**Course Code:** BOTPCOR01T  
**Topic Name:** INTEGRATED LIFE SCIENCES (ILS)

| CO, PO & PSO Mapping |       |  |                              |                   |              |
|----------------------|-------|--|------------------------------|-------------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level Blooms Level | POs Mapping       | PSOs mapping |
|                      | CO1   | Able to better understand about basic common arenas of life sciences such as basic cell structure and function and cell signalling   | L2 Understanding             | 1,2,3,4,7,8       | 1,4,5,6      |
|                      | CO2   | Execute knowledge on cancer biology in the field of cancer research.   | L3 Applying                  | 1,2,4,6,7,8       | 2,4,5,       |
|                      | CO3   | Apply the knowledge of immunology development, Mendelian genetics and molecular biological techniques in understanding different field of biology.   | L3 Applying                  | 1,2,3,4,6,7,8,9   | 1,4,5,6      |
|                      | CO4   | Broadened their vision and acceptance for more complex courses based on this foundation in subsequent semesters  | L3 Applying                  | 1,2,3,4,6,7,8,9   | 1,2,3,4,5,6  |
|                      | CO5   | Acquainted with modern techniques and topics of life science apart from the plant science that will familiarize students with very broader aspects of life sciences which will be beneficial to all students in all India based examinations like NET, GATE etc. | L3 Applying                  | 1,2,3,4,5,6,7,8,9 | 1,2,3,4,5,6  |
|                      | CO6   | Study different statistical techniques for data analysis in various biological fields.   | L3 Applying                  | 1,2,3,4,6,7,8,9   | 1,2,3,4,5,6  |
|                      |       |  |                              |                   |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>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    |      |      | 3    | 3    |      |      | 3    |      |      | 3    | 3    | 2    |      |      |      |
| CO2  | 2    | 3    |      | 2    |      | 3    | 3    | 3    |      |      |      | 2    |      | 3    | 3    |      |      |      |      |
| CO3  | 3    | 3    | 2    | 2    |      | 3    | 3    | 3    | 2    |      | 3    |      |      | 3    | 3    | 3    |      |      |      |
| CO4  | 2    | 2    | 2    | 2    |      | 2    | 2    | 3    | 2    |      | 1    | 1    | 1    | 2    | 2    | 2    |      |      |      |
| CO5  | 3    | 3    | 3    | 3    | 2    | 3    | 3    | 3    | 3    |      | 3    | 2    | 2    | 3    | 3    | 3    |      |      |      |
| CO6  | 3    | 3    | 3    | 3    |      | 3    | 3    | 3    | 3    |      | 3    | 2    | 2    | 3    | 3    | 3    |      |      |      |
|  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.33 | 2.83 | 2.40 | 2.33 | 2.00 | 2.80 | 2.83 | 3.00 | 2.50 |      | 2.60 | 1.75 | 1.67 | 2.83 | 2.83 | 2.60 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-2  
**Course Code:** BOTPCOR02T  
**Topic Name:** DIVERSITY OF PLANT LIFE-ALGAE & BRYOPHYTES

| CO, PO & PSO Mapping |       |  |                                 |               |              |
|----------------------|-------|--|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Understand the diversity of the major life forms of algae and bryophytes.  | L2<br>Understanding             | 1,2,4,6,7,8   | 1,2,3,4,5,6  |
|                      | CO2   | Acquire the knowledge regarding morphological, anatomical and genetic structure, interrelationships of algae and bryophytes. | L2<br>Understanding             | 1,2,4,6,7,8   | 1,2,3,4,5,6  |
|                      | CO3   | Understand the knowledge of algae in production of bio fuel, space research etc.   | L2<br>Understanding             | 1,2,3,6,7,8   | 1,2,3,4,5,6  |
|                      | CO4   | Study bryophytes and algae in developing sustainable environment.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      | CO5   | Aware of the role of algae and bryophytes in commercial uses and industrial applications through this course.                | L3<br>Applying                  | 1,2,4,6,7,8   | 1,2,3,4,5,6  |
|                      | CO6   | Able to understand the origin and evolution of algae and bryophytes.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      |       |  |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 2    | 3    |      | 2    |     | 2    | 2    | 2    |     |      | 3    | 2    | 3    | 2    | 3    | 1    |      |      |      |
| CO2  | 2    | 3    |      | 2    |     | 3    | 2    | 3    |     |      | 3    | 2    | 3    | 2    | 3    | 2    |      |      |      |
| CO3  | 2    | 2    | 1    |      |     | 3    | 3    | 3    |     |      | 2    | 1    | 2    | 2    | 2    | 2    |      |      |      |
| CO4  | 1    | 3    | 2    | 1    |     | 2    | 2    | 1    |     |      | 1    | 3    | 3    | 1    | 2    | 3    |      |      |      |
| CO5  | 3    | 2    |      | 2    |     | 1    | 1    | 2    |     |      | 3    | 2    | 1    | 2    | 2    | 3    |      |      |      |
| CO6  | 2    | 3    | 2    | 3    |     | 2    | 2    | 3    |     |      | 2    | 2    | 3    | 2    | 2    | 2    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.00 | 2.67 | 1.67 | 2.00 |     | 2.17 | 2.00 | 2.33 |     |      | 2.33 | 2.00 | 2.50 | 1.83 | 2.33 | 2.17 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-3  
**Course Code:** BOTPCOR03T  
**Topic Name:** FUNGAL & OOMYCETE BIOLOGY

| CO, PO & PSO Mapping |       |   |                                 |                 |              |
|----------------------|-------|---|---------------------------------|-----------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping     | PSOs mapping |
|                      | CO1   | Comprehend the modern trends in diversity, structure organisation, ultrastructure of the fungi .  | L4<br>Analysing                 | 1,2,3,4,6,7,8   | 1,3,4,5      |
|                      | CO2   | Understand the major roles of fungi in ecosystem, from the degradation of organic matter and nutrient cycling to plant symbioses and as pathogens of plants, animals, and humans. | L2<br>Understanding             | 1,2,3,4,6,7,8   | 1,2,3,4,5    |
|                      | CO3   | Learn about the classification, diversity, hosts ranging, phylogeny and parasitic lifestyles of Oomycetes, the most diverse and widespread group of                               | L2<br>Understanding             | 1,2,3,4,6,7,8   | 1,3,4,5      |
|                      | CO4   | Explore the role of Fungi and oomycetes as pathogen causing various type of plant diseases and learn about disease management.  | L3<br>Applying                  | 1,2,3,4,6,7,8,9 | 1,2,3,4,5,6  |
|                      | CO5   | Know the general account and ecological and economic importance mycorrhiza and lichen.  | L2<br>Understanding             | 1,2,3,4,6,7,8   | 1,3,4,5      |
|                      | CO6   | Understand the role of fungi in ecological studies.   | L2<br>Understanding             | 1,2,3,6,7,8     | 1,2,3,4,5    |
|                      |       |   |                                 |                 |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9  | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 2    | 2    |     | 2    | 2    | 2    |      |      | 3    |      | 3    | 2    | 3    |      |      |      |      |
| CO2  | 3    | 2    | 2    | 2    |     | 2    | 2    | 3    |      |      | 2    | 2    | 3    | 3    | 2    |      |      |      |      |
| CO3  | 2    | 3    | 1    | 1    |     | 2    | 3    | 2    |      |      | 3    |      | 3    | 2    | 2    |      |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    | 3    |      | 3    | 3    | 2    | 2    | 3    | 2    |      |      |      |
| CO5  | 1    | 3    | 2    | 2    |     | 1    | 1    | 2    |      |      | 3    |      | 3    | 1    | 2    |      |      |      |      |
| CO6  | 2    | 1    | 2    |      |     | 3    | 2    | 1    |      |      | 1    | 1    | 3    | 1    | 1    |      |      |      |      |
|  |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.33 | 2.50 | 2.00 | 2.00 |     | 2.17 | 2.17 | 2.17 | 3.00 |      | 2.50 | 2.00 | 2.83 | 1.83 | 2.17 | 2.00 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-4  
**Course Code:** BOTPCOR04T  
**Topic Name:** PLANT VIRUSES & BACTERIA

| CO, PO & PSO Mapping |       |  |                                 |                 |              |
|----------------------|-------|--|---------------------------------|-----------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping     | PSOs mapping |
|                      | CO1   | Understand the general structure and functions of the prokaryote, microbial growth and different microbial growth controlling factors and about the different types of culture media.  | L2<br>Understanding             | 1,2,3,4,6,7,8   | 1,2,3,4,5,6  |
|                      | CO2   | Know the role of microorganisms in food and pharmaceutical industry, their sources, methods of disinfection, sterilization and preservation of food and pharmaceutical formulations.   | L2<br>Understanding             | 1,2,3,4,6,7,8   | 1,2,3,4,5,6  |
|                      | CO3   | Realize the microbial genetics.  | L2<br>Understanding             | 1,2,6,7,8       | 1,4,5,6      |
|                      | CO4   | Understand the different diseases caused by the plant bacteria and their control measures  | L2<br>Understanding             | 1,2,3,4,6,7,8,9 | 1,2,3,4,5,6  |
|                      | CO5   | Recognize the architecture of viruses, their classification, general replication strategies of viruses, their intricate interaction between viruses and host cells and different assay and purification techniques of the plant viruses. | L3<br>Applying                  | 1,2,3,4,6,7,8   | 1,4,5,6      |
|                      | CO6   | Explore the role of viruses for the development of virus resistant plants, and as tools for cloning vectors and for gene transfer.   | L4<br>Analysing                 | 1,2,3,4,6,7,8   | 1,2,3,4,5,6  |
|                      |       |  |                                 |                 |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9  | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 3    | 2    |     | 3    | 2    | 2    |      |      | 3    | 2    | 3    | 3    | 2    | 2    |      |      |      |
| CO2  | 3    | 2    | 2    | 2    |     | 2    | 1    | 3    |      |      | 2    | 1    | 2    | 2    | 1    | 3    |      |      |      |
| CO3  | 2    | 3    |      |      |     | 3    | 3    | 3    |      |      | 3    |      |      | 3    | 2    | 2    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    | 3    |      | 3    | 3    | 2    | 2    | 3    | 1    |      |      |      |
| CO5  | 2    | 2    | 2    | 1    |     | 1    | 1    | 2    |      |      | 3    |      |      | 2    | 2    | 3    |      |      |      |
| CO6  | 1    | 1    | 1    | 1    |     | 1    | 1    | 1    |      |      | 1    | 1    | 1    | 3    | 2    | 3    |      |      |      |
|  |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.33 | 2.33 | 2.20 | 1.80 |     | 2.17 | 1.83 | 2.33 | 3.00 |      | 2.50 | 1.75 | 2.00 | 2.50 | 2.00 | 2.33 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

Course Name: CORE COURSE-5

Course Code: BOTPCOR05P

Topic Name: LABORATORY COURSE

| CO, PO & PSO Mapping |       |   |                                 |                   |              |
|----------------------|-------|---|---------------------------------|-------------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping       | PSOs mapping |
|                      | CO1   | Understand the diversity of algae, bryophytes, fungi, oomycetes, bacteria and viruses in various habitats, their morphology and identification. | L2<br>Understanding             | 1,2,3,4,5,6,7,8   | 1,3,4,5,6    |
|                      | CO2   | Use different modern molecular techniques in different field of biology.  | L3<br>Applying                  | 1,2,3,4,5,6,7,8,9 | 1,3,4,5,6    |
|                      | CO3   | Apply serological detection techniques and phylogenetic softwares for identification and determination of phylogenetic relationship.            | L3<br>Applying                  | 1,2,3,4,5,6,7,8,9 | 1,3,4,5,6    |
|                      | CO4   | Conduct various commonly used molecular biology techniques in plant sciences.   | L3<br>Applying                  | 1,2,3,4,5,6,7,8,9 | 1,3,4,5,6    |
|                      | CO5   | Apply the knowledge of different statistical techniques for data analysis in various biological fields.   | L3<br>Applying                  | 1,2,3,4,6,7,8,9   | 1,4,5,6      |
|                      | CO6   | Execute the knowledge of different plant types in developing sustainable environment.   | L3<br>Applying                  | 1,2,3,4,5,6,7,8   | 1,2,3,4,5,6  |
|                      |       |   |                                 |                   |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5  | PO6  | PO7  | PO8  | PO9  | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 2    | 2    | 2    | 2    | 2    | 2    |      |      | 3    |      | 3    | 2    | 3    | 3    |      |      |      |
| CO2  | 3    | 3    | 3    | 3    | 2    | 3    | 3    | 3    | 2    |      | 3    |      | 2    | 3    | 2    | 3    |      |      |      |
| CO3  | 3    | 3    | 3    | 3    | 2    | 3    | 3    | 2    | 2    |      | 3    |      | 2    | 3    | 2    | 3    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    | 2    | 3    | 2    | 3    | 3    |      | 3    |      | 1    | 3    | 2    | 3    |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |      | 3    | 3    | 2    | 3    |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
| CO6  | 2    | 3    | 2    | 2    | 3    | 1    | 2    | 3    |      |      | 2    | 3    | 3    | 2    | 1    | 1    |      |      |      |
|  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.83 | 3.00 | 2.67 | 2.67 | 2.20 | 2.50 | 2.50 | 2.50 | 2.50 |      | 2.83 | 3.00 | 2.20 | 2.67 | 2.00 | 2.67 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-6  
**Course Code:** BOTPCOR06T  
**Topic Name:** ANGIOSPERM SYSTEMATICS

| CO, PO & PSO Mapping |       |  |                                 |               |              |
|----------------------|-------|--|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Understand the diversification of flowering plants.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4        |
|                      | CO2   | Learn about the advanced aspects of the principles of taxonomy (identification, nomenclature, classification of flowering plants).   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO3   | Know the origin and evolution (speciation, reproductive biology, adaptation, convergence, biogeography) of flowering plants.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO4   | Study the phylogenetic (phenetics, cladistics, morphology and molecules) relationships among different groups of flowering plants.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5,6    |
|                      | CO5   | Classify and systematic survey of plant families, understand the evolutionary processes and patterns in the major families and develop expertise on the representative families and local flora. | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      | CO6   | Comprehend about the molecular systematic including nuclear, mitochondrial, chloroplast genomes, different methods and tools used in phylogeny reconstruction.                                   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,3,4,5,6    |
|                      |       |  |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 2    | 3    | 2    | 1    |     | 1    | 3    | 2    |     |      | 3    |      | 3    | 2    |      |      |      |      |      |
| CO2  | 3    | 3    | 2    | 2    |     | 2    | 3    | 2    |     |      | 3    |      | 3    | 2    | 2    |      |      |      |      |
| CO3  | 3    | 3    | 3    | 3    |     | 3    | 3    | 2    |     |      | 3    |      | 3    | 2    | 2    |      |      |      |      |
| CO4  | 3    | 3    | 3    | 2    |     | 3    | 3    | 3    |     |      | 3    |      | 2    | 2    | 2    | 2    |      |      |      |
| CO5  | 2    | 3    | 2    | 2    |     | 2    | 2    | 2    |     |      | 3    | 1    | 2    | 2    | 1    | 3    |      |      |      |
| CO6  | 3    | 2    | 3    | 3    |     | 3    | 2    | 3    |     |      | 3    |      | 2    | 2    | 2    | 3    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.67 | 2.83 | 2.50 | 2.17 |     | 2.33 | 2.67 | 2.33 |     |      | 3.00 | 1.00 | 2.50 | 2.00 | 1.80 | 2.67 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-7  
**Course Code:** BOTPCOR07T  
**Topic Name:** PLANT ECOLOGY & ENVIRONMENTAL BIOLOGY

| CO, PO & PSO Mapping |       |  |                                 |               |              |
|----------------------|-------|--|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Study the issues of plant ecology and the environmental interaction of plant system.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5    |
|                      | CO2   | Learn about the interspecies competition and resilience study.   | L1<br>Remembering               | 1,2,3,4,6,7,8 | 1,2,3,4      |
|                      | CO3   | Study different biodiversity zones of the world assessment.  | L2<br>Understanding             | 1,2,3,4,7,8   | 1,2,3,4      |
|                      | CO4   | Learn themes of conservation based on ecology.   | L1<br>Remembering               | 1,2,3,4,7,8   | 1,2,3,4      |
|                      | CO5   | Develop awareness regarding environmental biology including different types of pollution, their impact on plants and animals, environmental issues, policies and regulation which will be really beneficial for environment and society. | L3<br>Applying                  | 1,2,3,7,8     | 1,2,3,4      |
|                      | CO6   | Study the development of sustainable environment.  | L2<br>Understanding             | 1,2,3,4,7,8   | 1,2,3,4,     |
|                      |       |  |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 2    | 2    | 1    | 1    |     | 1    | 2    | 1    |     |      | 2    | 3    | 3    | 3    | 2    |      |      |      |      |
| CO2  | 2    | 2    | 1    | 1    |     | 1    | 1    | 1    |     |      | 2    | 3    | 2    | 2    |      |      |      |      |      |
| CO3  | 2    | 2    | 1    | 1    |     |      | 1    | 1    |     |      | 2    | 1    | 3    | 3    |      |      |      |      |      |
| CO4  | 2    | 2    | 1    | 1    |     |      | 1    | 1    |     |      | 2    | 2    | 3    | 2    |      |      |      |      |      |
| CO5  | 2    | 2    | 2    |      |     |      | 2    | 2    |     |      | 2    | 3    | 3    | 2    |      |      |      |      |      |
| CO6  | 3    | 2    | 2    | 2    |     |      | 2    | 3    |     |      | 2    | 3    | 3    | 1    |      |      |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.17 | 2.00 | 1.33 | 1.20 |     | 1.00 | 1.50 | 1.50 |     |      | 2.00 | 2.50 | 2.83 | 2.17 | 2.00 |      |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-8  
**Course Code:** BOTPCOR08T  
**Topic Name:** PLANT PATHOLOGY & CROP PROTECTION

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Learn the role of diseases caused by representative pathogens   | L1<br>Remembering               | 1,2,3,4,6,7,8 | 1,4,5        |
|                      | CO2   | Study life cycle of different pathogens for better crop management.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO3   | Understand the molecular mechanism of host –pathogen interaction.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO4   | Study disease resistance, and its translational use for the development of disease resistant plants through genetic engineering.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5    |
|                      | CO5   | Identify the diseases based on the symptoms and their control measures, disease control strategies with special reference to principles of plant viral disease management | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      | CO6   | Study the mechanism for protection of different crops.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 2    | 3    | 2    | 2    |     | 2    | 2    | 2    |     |      | 3    |      |      | 2    | 2    |      |      |      |      |
| CO2  | 3    | 3    | 3    | 2    |     | 2    | 2    | 2    |     |      | 3    |      | 3    | 2    | 2    |      |      |      |      |
| CO3  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      | 2    | 3    | 3    |      |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    | 2    | 2    | 3    | 3    |      |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |     | 3    | 3    | 2    |     |      | 3    | 2    | 2    | 3    | 2    | 3    |      |      |      |
| CO6  | 2    | 3    | 2    | 2    |     | 2    | 2    | 2    |     |      | 2    | 3    | 3    | 2    | 2    | 2    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.67 | 3.00 | 2.67 | 2.50 |     | 2.50 | 2.50 | 2.33 |     |      | 2.83 | 2.33 | 2.40 | 2.50 | 2.33 | 2.50 |      |      |      |



**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

Course Name: CORE COURSE-9

Course Code: BOTPCOR09T

Topic Name: DIVERSITY OF PLANT LIFE - PTERIDOPHYTES, GYMNOSPERMS, PALAEOBOTANY & PALYNOLOGY

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Learn about the diversity of the major life forms of pteridophytes and gymnosperms as well as their fossil members and their biology. | L1<br>Remembering               | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO2   | Study origin, evolution and phylogeny of Pteridophytes and Gymnosperms.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO3   | Understand the role of pteridophytes and gymnosperms in environment.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5    |
|                      | CO4   | Study the role of pteridophytes and gymnosperms in commercial uses and industrial applications.                                       | L2<br>Understanding             | 1,2,3,6,7,8   | 1,3,4,5,6    |
|                      | CO5   | Understand the evolutionary interrelationships between these groups and angiosperms both from extant and extinct genera.              | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO6   | Explore the knowledge of different aspect of palaeobotany and palynology.   | L3<br>Applying                  | 1,2,3,6,7,8   | 1,3,4,5,6    |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 1    | 2    | 1    | 1    |     | 1    | 2    | 1    |     |      | 2    |      | 2    | 1    | 1    |      |      |      |      |
| CO2  | 2    | 3    | 2    | 1    |     | 1    | 2    | 1    |     |      | 3    |      | 3    | 2    | 1    |      |      |      |      |
| CO3  | 2    | 2    | 2    | 2    |     | 2    | 2    | 2    |     |      | 2    | 3    | 3    | 1    | 1    |      |      |      |      |
| CO4  | 1    | 2    | 1    |      |     | 2    | 2    | 1    |     |      | 2    |      | 1    | 2    | 1    | 2    |      |      |      |
| CO5  | 3    | 3    | 3    | 2    |     | 3    | 3    | 3    |     |      | 3    |      | 3    | 2    | 1    |      |      |      |      |
| CO6  | 1    | 2    | 2    |      |     | 2    | 1    | 2    |     |      | 3    |      | 3    | 2    | 2    | 2    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 1.67 | 2.33 | 1.83 | 1.50 |     | 1.83 | 2.00 | 1.67 |     |      | 2.50 | 3.00 | 2.50 | 1.67 | 1.17 | 2.00 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-10  
**Course Code:** BOTPCOR10T  
**Topic Name:** LABORATORY COURSE

| CO, PO & PSO Mapping |       |  |                                 |                 |              |
|----------------------|-------|--|---------------------------------|-----------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping     | PSOs mapping |
|                      | CO1   | Handle, identify and analyze diseased plant materials in the laboratory/herbarium and in the field.  | L3<br>Applying                  | 1,2,3,4,5,6,7,8 | 1,2,3,4,5,6  |
|                      | CO2   | Use scientific terminology accurately through effective oral and written communication and the use of dichotomous keys in a regional floristic manual. | L3<br>Applying                  | 1,2,3,6,7,8     | 1,3,4,6      |
|                      | CO3   | Implement various techniques related to plant pathology.   | L3<br>Applying                  | 1,2,3,4,6,7,8   | 1,4,5,6,     |
|                      | CO4   | Examine and compare the diversity of pteridophytes and gymnosperms.  | L5<br>Evaluating                | 1,2,3,4,6,7,8   | 1,3,4,5,6    |
|                      | CO5   | Study plant fossils for study of origin and evolution of different plant types.  | L2<br>Understanding             | 1,2,3,4,6,7,8   | 1,3,4,5,6    |
|                      | CO6   | Study palynological samples as well as their handling techniques to understand phylogeny and interrelationship among different plant groups.           | L2<br>Understanding             | 1,2,3,4,6,7,8   | 1,3,4,5,6    |
|                      |       |  |                                 |                 |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5  | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |     |      | 3    | 2    | 3    | 3    | 3    | 3    |      |      |      |
| CO2  | 2    | 2    | 2    |      |      | 1    | 3    | 1    |     |      | 2    |      | 3    | 1    |      | 3    |      |      |      |
| CO3  | 3    | 3    | 3    | 2    |      | 3    | 2    | 3    |     |      | 2    |      |      | 3    | 2    | 3    |      |      |      |
| CO4  | 1    | 3    | 3    | 1    |      | 2    | 1    | 2    |     |      | 3    |      | 3    | 1    | 3    | 2    |      |      |      |
| CO5  | 2    | 3    | 2    | 2    |      | 2    | 2    | 1    |     |      | 3    |      | 3    | 2    | 2    | 2    |      |      |      |
| CO6  | 3    | 3    | 3    | 2    |      | 3    | 3    | 2    |     |      | 3    |      | 3    | 2    | 2    | 3    |      |      |      |
|  |      |      |      |      |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.33 | 2.83 | 2.67 | 2.00 | 3.00 | 2.33 | 2.33 | 2.00 |     |      | 2.67 | 2.00 | 3.00 | 2.00 | 2.40 | 2.67 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

Course Name: CORE COURSE-11

Course Code: BOTPCOR11T

Topic Name: MOLECULAR & CELLULAR GENETICS & PLANT BREEDING

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Learn the key concepts and fundamental mechanisms for the organization, replication, expression, variation, and evolution of genetic material at the molecular level, as well as methodologies for molecular genetic analysis and | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5        |
|                      | CO2   | Understand the modern concept of gene, its variations in frequency, structure and regulation as well as methodologies for studying them via model systems.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO3   | Exercise transmission genetics (including linkage analysis), quantitative and population genetics.  | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO4   | Understand different aspects molecular biology and cell biology for better application in future research.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5        |
|                      | CO5   | Gain a thorough understanding of the different modern instruments and equipment techniques used in Molecular Biology, Cytogenetics, and Plant breeding, Biotechnology as well as their applications.                              | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Procure the skills to critically assess and review scientific Journals and general media presentations, as well as to retrieve and analyze molecular information and interpret genetic data on molecular biology-related topics.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6,     |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 2    | 2    |     | 2    | 2    | 2    |     |      | 3    |      |      | 3    | 1    |      |      |      |      |
| CO2  | 3    | 3    | 3    | 2    |     | 3    | 3    | 2    |     |      | 3    |      |      | 3    | 2    | 2    |      |      |      |
| CO3  | 2    | 3    | 2    | 2    |     | 2    | 2    | 2    |     |      | 3    |      | 2    | 3    | 1    |      |      |      |      |
| CO4  | 2    | 3    | 2    | 2    |     | 2    | 2    | 2    |     |      | 2    |      |      | 3    | 2    |      |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 3    | 3    |      |      |      |
| CO6  | 3    | 2    | 3    | 3    |     | 3    | 3    | 3    |     |      | 2    |      |      | 3    | 3    | 3    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.67 | 2.83 | 2.50 | 2.33 |     | 2.50 | 2.50 | 2.33 |     |      | 2.67 |      | 2.00 | 3.00 | 2.00 | 2.67 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-12  
**Course Code:** BOTPCOR12T  
**Topic Name:** PLANT PHYSIOLOGY & BIOCHEMISTRY

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Understand to the fundamentals of plant physiology and biochemistry.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4          |
|                      | CO2   | Execute the importance of biological macromolecules.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,6        |
|                      | CO3   | Illustrate the knowledge of stress adaptations in biological systems.   | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,4,6        |
|                      | CO4   | Accomplish the role of biomolecules in different metabolic activities.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,6        |
|                      | CO5   | Analyse various physiological processes such as photosynthesis, photorespiration, nitrogen fixation, plant specific growth hormonal   | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Obtain the basic physiological and biochemical knowledge of plant systems, which will aid in the development of further concepts, and will be knowledgeable enough to select elective courses for the following semester based on their grasp of the subject. | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 1    | 2    | 1    | 1    |     | 1    | 1    | 1    |     |      | 2    |      |      | 2    |      |      |      |      |      |
| CO2  | 2    | 2    | 2    | 1    |     | 2    | 1    | 2    |     |      | 2    |      |      | 3    |      | 1    |      |      |      |
| CO3  | 2    | 3    | 2    | 2    |     | 2    | 2    | 2    |     |      | 3    |      |      | 3    |      | 2    |      |      |      |
| CO4  | 3    | 3    | 3    | 2    |     | 2    | 2    | 3    |     |      | 3    |      |      | 3    |      | 2    |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |     | 2    | 2    | 3    |     |      | 3    |      |      | 3    | 2    | 2    |      |      |      |
| CO6  | 2    | 3    | 2    | 1    |     | 3    | 1    | 2    |     |      | 3    |      |      | 3    | 3    | 2    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.17 | 2.67 | 2.17 | 1.67 |     | 2.00 | 1.50 | 2.17 |     |      | 2.67 |      |      | 2.83 | 2.50 | 1.80 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-13  
**Course Code:** BOTPCOR14P  
**Topic Name:** LABORATORY COURSE -MOLECULAR & CELLULAR GENETICS & PLANT BREEDING

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Study various experiments in molecular biology, cytogenetics for better understanding.                    | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,6        |
|                      | CO2   | Design various experiment in plant breeding to improve quality and quantity of crop plants.               | L6<br>Creating                  | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      | CO3   | Understand various methods of plant breeding programme.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,6        |
|                      | CO4   | Understand molecular approaches in plant breeding techniques.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO5   | Build technical skills in the selection and use of appropriate laboratory equipments and other materials. | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Develop the competence to use instruments safely and responsibly to achieve the desired outcome.          | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,6        |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 2    | 3    | 2    | 2    |     | 2    | 1    | 2    |     |      | 2    |      |      | 2    |      | 3    |      |      |      |
| CO2  | 2    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 3    | 1    | 1    | 3    | 2    | 3    |      |      |      |
| CO3  | 2    | 3    | 2    | 2    |     | 2    | 1    | 2    |     |      | 2    |      |      | 2    |      | 3    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
| CO5  | 3    | 2    | 3    | 3    |     | 3    | 3    | 3    |     |      | 2    |      |      | 2    | 2    | 3    |      |      |      |
| CO6  | 1    | 1    | 1    | 1    |     | 1    | 1    | 1    |     |      | 1    |      |      | 1    |      | 2    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.17 | 2.50 | 2.33 | 2.33 |     | 2.33 | 1.67 | 2.33 |     |      | 2.17 | 1.00 | 1.00 | 2.17 | 2.00 | 2.83 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-14  
**Course Code:** BOTPCOR15P  
**Topic Name:** LABORATORY COURSE-PLANT  
 PHYSIOLOGY & BIOCHEMISTRY

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Test various experiments in plant physiology, biochemistry, and developmental studies.                                | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,3,4,5,6    |
|                      | CO2   | Learn to conduct their own experiments on major plant biochemical activities such as photosynthesis, respiration etc. | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO3   | Study stress physiology and stress managements.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      | CO4   | Study enzyme activity measurement, and Km calculation, among others.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO5   | Procure knowledge about protein quantification and enzyme assay which will further help in their research activities. | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Apply molecular techniques in the study of different physiological and biochemical processes.                         | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 3    |      | 1    | 2    | 2    | 3    |      |      |      |
| CO2  | 2    | 3    | 2    | 2    |     | 2    | 2    | 2    |     |      | 3    |      |      | 2    | 1    | 3    |      |      |      |
| CO3  | 3    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 3    | 2    | 2    | 3    | 2    | 3    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 3    | 3    |      |      |      |
| CO6  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.83 | 3.00 | 2.83 | 2.83 |     | 2.83 | 2.50 | 2.83 |     |      | 3.00 | 2.00 | 1.50 | 2.67 | 2.00 | 3.00 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

Course Name: DISCIPLINE SPECIFIC ELECTIVE-1

Course Code: BOTPDSE01T

Topic Name: PHYTOCHEMISTRY AND PHARMACOGNOSY

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Acquire knowledge about basic metabolic pathways for production of metabolites in plants.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4        |
|                      | CO2   | Obtain knowledge about therapeutically important active phytoconstituents.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO3   | Study the role of different phytochemicals in growth and development of human beings.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5,6    |
|                      | CO4   | Study the isolation mechanisms of different phytochemicals and their application in the production of various medicines.                                | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5,6    |
|                      | CO5   | Understand the knowledge of plant-based pharmaceutical adjuvants and its pharmacodynamics and pharmacokinetic aspects.                                  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4          |
|                      | CO6   | Realize the importance of pharmacovigilance in herbal therapy, crude drugs and concepts of its formulation using Ethnopharmacognosy, Ethnomedicine etc. | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,3,4        |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 2    | 2    | 2    | 1    |     | 1    | 1    | 1    |     |      | 2    |      | 2    | 1    |      |      |      |      |      |
| CO2  | 2    | 3    | 2    | 2    |     | 1    | 2    | 1    |     |      | 2    |      | 3    | 2    | 1    |      |      |      |      |
| CO3  | 2    | 3    | 3    | 3    |     | 2    | 3    | 3    |     |      | 3    |      | 3    | 2    | 2    | 2    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 2    |     |      | 3    |      | 2    | 2    | 2    | 2    |      |      |      |
| CO5  | 1    | 2    | 1    | 1    |     | 2    | 1    | 2    |     |      | 1    |      |      | 1    |      |      |      |      |      |
| CO6  | 2    | 1    | 2    | 2    |     | 1    | 1    | 2    |     |      | 1    |      | 3    | 1    |      |      |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.00 | 2.33 | 2.17 | 2.00 |     | 1.67 | 1.83 | 1.83 |     |      | 2.00 |      | 2.60 | 1.50 | 1.67 | 2.00 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** DISCIPLINE SPECIFIC ELECTIVE-2  
**Course Code:** BOTPDSE02T-1  
**Topic Name:** PLANT VIROLOGY & MOLECULAR MYCOLOGY

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Understand the economic and pathological importance of plant viruses, their nature, properties and classification.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5    |
|                      | CO2   | Acquire the knowledge about origin and evolution of virus, the nature of viruses as well as that of virus-like entities.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4        |
|                      | CO3   | Study the role of satellite viruses and satellite RNAs, viroid, virusoids etc. in plant disease etiology.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,3,4,5      |
|                      | CO4   | Recognize diseases caused by viruses, as well as their symptomatology, transmission, purification, assays and control strategies.   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      | CO5   | Elucidate the diversity and importance of fungi and oomycetes.  | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,3,4,5,6    |
|                      | CO6   | Understand the role of fungi and oomycetes in the environment, as well as their biology, interrelationships, genomic organisation, commercial applications, and biological resources. | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5    |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 2    | 2    |     | 2    | 2    | 3    |     |      | 3    | 1    | 2    | 2    | 1    |      |      |      |      |
| CO2  | 2    | 3    | 2    | 2    |     | 2    | 2    | 3    |     |      | 3    |      | 2    | 2    |      |      |      |      |      |
| CO3  | 2    | 2    | 2    | 2    |     | 2    | 2    | 2    |     |      | 2    |      | 2    | 2    | 1    |      |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 2    | 1    | 2    | 2    | 2    | 1    |      |      |      |
| CO5  | 2    | 3    | 3    | 3    |     | 3    | 2    | 2    |     |      | 3    |      | 3    | 3    | 2    | 1    |      |      |      |
| CO6  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    | 3    | 3    | 3    | 2    |      |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.50 | 2.83 | 2.50 | 2.50 |     | 2.50 | 2.33 | 2.67 |     |      | 2.67 | 1.67 | 2.33 | 2.33 | 1.60 | 1.00 |      |      |      |



**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** DISCIPLINE SPECIFIC ELECTIVE-3  
**Course Code:** BOTPDSE02T-2  
**Topic Name:** MOLECULAR GENETICS & ADVANCED CELL BIOLOGY

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Comprehend genetic information and the genome's various molecular features, regulation of genetic information expression, maintenance, organisation, and evolution. | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,4,5        |
|                      | CO2   | Demonstrate in-depth understanding of cell cycle and cancer biology.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO3   | Understand protein sorting, trafficking, signalling, and proteomics, as well as their applications in modern biology.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO4   | Explore the most recent advances in gene technology such as RNA biology and gene editing techniques.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5        |
|                      | CO5   | Learn vivid idea about Genomics, Proteomics and Transcriptomics.  | L1<br>Remembering               | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Acquire the knowledge of genome editing in the light of plant improvement.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 1    | 2    |      |      |      |      |
| CO2  | 3    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 3    |      |      | 3    | 2    | 1    |      |      |      |
| CO3  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 2    | 2    | 2    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    |      |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 2    |      |      |      |
| CO6  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 2    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 3.00 | 3.00 | 3.00 | 3.00 |     | 3.00 | 2.83 | 3.00 |     |      | 3.00 |      |      | 2.50 | 2.00 | 1.75 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** DISCIPLINE SPECIFIC ELECTIVE-4  
**Course Code:** BOTPDSE02T-3  
**Topic Name:** ADVANCED PLANT PHYSIOLOGY& BIOCHEMISTRY

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Obtain the knowledge about advanced plant physiology and biochemistry in this course.                                     | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4          |
|                      | CO2   | Broaden their knowledge on various current aspects which will motivate them to conduct additional research in this field. | L4<br>Annalysing                | 1,2,3,4,6,7,8 | 1,4,6        |
|                      | CO3   | Demonstrate any topic based on their interest in this versatile field.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO4   | Procure knowledge about protein quantification and enzyme assay which will further help in their research activities.     | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO5   | Apply molecular techniques in the study of different physiological and biochemical processes.                             | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Study stress physiology and stress managements.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 1    | 2    | 2    | 2    |     | 1    | 1    | 1    |     |      | 2    |      |      | 2    |      |      |      |      |      |
| CO2  | 2    | 1    | 2    | 1    |     | 1    | 1    | 1    |     |      | 1    |      |      | 1    |      | 1    |      |      |      |
| CO3  | 2    | 1    | 2    | 2    |     | 2    | 1    | 2    |     |      | 3    |      |      | 1    | 1    | 2    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
| CO6  | 3    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 3    | 2    | 2    | 3    | 1    | 2    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.33 | 2.17 | 2.50 | 2.33 |     | 2.17 | 1.83 | 2.17 |     |      | 2.50 | 2.00 | 2.00 | 2.17 | 1.50 | 2.20 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

Course Name: DISCIPLINE SPECIFIC ELECTIVE-5

Course Code: BOTPDSE03T-1

Topic Name: MOLECULAR PLANT PATHOLOGY

| CO, PO & PSO Mapping |       |  |                                 |               |              |
|----------------------|-------|--|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Illustrate the principles of disease epidemiology, molecular foundation of pathogen attack and plant pathogen interactions.          | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,2,3,4,5    |
|                      | CO2   | Demonstrate plant defence mechanism and its molecular diagnoses behind the interactive pathways.                                     | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO3   | Acquaint with long-term control methods, chemical control and its hazards, and production of contemporary disease-resistant variety. | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      | CO4   | Identify and quantify various plant pathogens by using serological methods.  | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,3,4,5,6    |
|                      | CO5   | Apply molecular techniques for protection of crop plants.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,3,4,5,6    |
|                      | CO6   | Produce genetically disease resistant plants.  | L6<br>Creating                  | 1,2,3,4,6,7,8 | 1,2,3,4,5,6  |
|                      |       |  |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 3    | 3    | 1    | 2    | 2    |      |      |      |      |
| CO2  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 2    | 2    | 3    |      |      |      |
| CO3  | 3    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 3    | 3    | 2    | 3    | 2    | 2    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      | 3    | 3    | 2    | 3    |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      | 3    | 3    | 2    | 3    |      |      |      |
| CO6  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    | 2    | 2    | 3    | 2    | 3    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 3.00 | 3.00 | 3.00 | 3.00 |     | 3.00 | 2.67 | 3.00 |     |      | 3.00 | 2.67 | 2.20 | 2.67 | 2.00 | 2.80 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** DISCIPLINE SPECIFIC ELECTIVE-6  
**Course Code:** BOTPDSE03T-2  
**Topic Name:** APPLIED PLANT BREEDING AND PLANT TISSUE CULTURE

| CO, PO & PSO Mapping |       |  |                                 |               |              |
|----------------------|-------|--|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Study plant breeding principles and several types of breeding procedures.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO2   | Exhibit micro and macropropagation principles and methodologies.   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO3   | Design various experiment in plant breeding to improve quality and quantity of crop plants.                                | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,3,4,5,6    |
|                      | CO4   | Study molecular approaches in plant breeding programme.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5        |
|                      | CO5   | Acquire advanced knowledge about marker assisted breeding.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Reveal knowledge of statistical principles and their applications in biological research, as well as statistical software. | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      |       |  |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 2    | 2    | 2    | 1    |     | 1    | 1    | 1    |     |      | 2    |      |      | 2    | 2    | 1    |      |      |      |
| CO2  | 3    | 3    | 3    | 2    |     | 3    | 2    | 3    |     |      | 3    |      |      | 3    | 2    | 1    |      |      |      |
| CO3  | 3    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 2    |      | 2    | 2    | 2    | 2    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    |      |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 3    | 3    |      |      |      |
| CO6  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 3    | 3    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.83 | 2.83 | 2.83 | 2.50 |     | 2.67 | 2.33 | 2.67 |     |      | 2.67 |      | 2.00 | 2.67 | 2.33 | 2.00 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

Course Name: DISCIPLINE SPECIFIC ELECTIVE-7

Course Code: BOTPDSE03T-3

Topic Name: PLANT MOLECULAR BIOLOGY

| CO, PO & PSO Mapping |       |  |                                 |               |              |
|----------------------|-------|--|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Delves into crucial aspects of plant molecular biology that hasn't been covered in depth in any of the other courses.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4          |
|                      | CO2   | Illustrate main aspects of plant biotechnology in a very concise and lucid manner, such as recombinant DNA technology, gene cloning, gene sequencing, genome projects, cloning vectors, proteomics, RNA interference, gene regulation, epigenetics, etc. | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,4,5        |
|                      | CO3   | Explore the most recent advances in gene technology such as RNA biology and gene editing techniques.   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO4   | Learn vivid idea about Genomics, Proteomics and Transcriptomics.   | L1<br>Remembering               | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO5   | Acquire the knowledge of genome editing in the light of plant improvement.   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5        |
|                      | CO6   | Prepare for CSIR/UGC NET and similar other examinations.   | L6<br>Creating                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      |       |  |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 3    | 2    |     | 2    | 2    | 2    |     |      | 2    |      |      | 2    |      |      |      |      |      |
| CO2  | 3    | 3    | 3    | 2    |     | 2    | 2    | 2    |     |      | 3    |      |      | 3    | 2    |      |      |      |      |
| CO3  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 3    | 3    |      |      |      |
| CO5  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 2    | 2    |      |      |      |      |
| CO6  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 2    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 3.00 | 3.00 | 3.00 | 2.67 |     | 2.67 | 2.67 | 2.67 |     |      | 2.83 |      |      | 2.67 | 2.20 | 2.67 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-15  
**Course Code:** BOTPCOR18P  
**Topic Name:** LABORATORY COURSE OF DSE 2 & 3]

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Demonstrate different modern biological techniques.   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO2   | Understand to deliver presentation through power point.   | L2<br>Understanding             | 1,3,4,6,7,8   | 5,6          |
|                      | CO3   | Prepare themselves for research career.   | L3<br>Applying                  | 1,3,4,5,6,7,8 | 1,2,3,4,5,6  |
|                      | CO4   | Emphasize practical courses that will follow the theoretical syllabus.  | L3<br>Applying                  | 1,2,3,4,6,8   | 1,4,5,6      |
|                      | CO5   | Build skills to detect problems in the field, solve them in the lab, and bringing the solutions back to the field as solutions. | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Understand data analysis for advanced research.   | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5  | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 2    | 2    | 2    | 2    |      | 2    | 1    | 2    |     |      | 2    |      |      | 2    | 2    | 3    |      |      |      |
| CO2  | 3    |      | 3    | 3    |      | 3    | 3    | 3    |     |      |      |      |      |      | 3    | 3    |      |      |      |
| CO3  | 3    |      | 3    | 3    | 2    | 3    | 3    | 3    |     |      | 2    | 2    | 2    | 3    | 3    | 2    |      |      |      |
| CO4  | 2    | 3    | 2    | 2    |      | 2    |      | 2    |     |      | 3    |      |      | 2    | 2    | 3    |      |      |      |
| CO5  | 3    | 3    | 3    | 3    | 2    | 3    | 3    | 3    |     |      | 3    |      |      | 2    | 3    | 3    |      |      |      |
| CO6  | 3    | 2    | 3    | 3    |      | 3    | 3    | 3    |     |      | 2    |      |      | 3    | 3    | 3    |      |      |      |
|  |      |      |      |      |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.67 | 2.50 | 2.67 | 2.67 | 2.00 | 2.67 | 2.60 | 2.67 |     |      | 2.40 | 2.00 | 2.00 | 2.40 | 2.67 | 2.83 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

Course Name: CORE COURSE-16

Course Code: BOTPCOR19P

Topic Name: LABORATORY COURSE -SEMINAR PRESENTATION]

| CO, PO & PSO Mapping |       |   |                                 |               |              |
|----------------------|-------|---|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Prepare for advanced topics related to their DSE choices.   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO2   | Learn to prepare experimental lay out to perform various biological experiments.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO3   | Understand data based analysis and computational work.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO4   | Improve the skill of presenting the findings from their experiments.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO5   | Improve the skills and, allowing them to pursue a career in higher education .  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Concentrate on the presentation of the student's research findings/review as scientific communication which is an important part of scientific research and gateway of their future career. | L4<br>Annalysing                | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      |       |   |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 3    | 3    |      |      |      |
| CO2  | 3    | 3    | 3    | 3    |     | 3    | 1    | 3    |     |      | 3    |      |      | 2    | 3    | 3    |      |      |      |
| CO3  | 3    | 1    | 3    | 3    |     | 3    | 3    | 3    |     |      | 1    |      |      | 1    | 3    | 3    |      |      |      |
| CO4  | 3    | 1    | 3    | 3    |     | 3    | 3    | 3    |     |      | 1    |      |      | 1    | 3    | 3    |      |      |      |
| CO5  | 3    | 2    | 3    | 3    |     | 3    | 3    | 3    |     |      | 2    |      |      | 1    | 2    | 2    |      |      |      |
| CO6  | 3    | 1    | 3    | 3    |     | 3    | 3    | 3    |     |      | 1    |      |      | 1    | 3    | 3    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 3.00 | 1.83 | 3.00 | 3.00 |     | 3.00 | 2.67 | 3.00 |     |      | 1.83 |      |      | 1.50 | 2.83 | 2.83 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** CORE COURSE-17  
**Course Code:** BOTPCOR20P  
**Topic Name:** DISSERTATION PROJECT WORK]

| CO, PO & PSO Mapping |       |  |                                 |               |              |
|----------------------|-------|--|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Expose themselves to the research field and solving problems by using web-based resources and physical databases (where applicable).   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO2   | Design experiments and will be familiar with several tools and technologies that can be used to do so.   | L6<br>Creating                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO3   | Execute various biological techniques as well as in-silico and wet lab instrumentations.   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO4   | Execute data based analysis and computational work in detail.  | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO5   | Demonstrate their findings and conclude their results which not only expand their horizon of study but also equipped them to prepare for a research laboratories and industries. | L4<br>Analysing                 | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Improve the skill of delivering oral presentation based on their project work.   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      |       |  |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 1    | 3    | 3    |     | 3    | 3    | 3    |     |      | 1    |      |      | 3    | 3    | 3    |      |      |      |
| CO2  | 3    | 1    | 3    | 3    |     | 3    | 3    | 3    |     |      | 1    |      |      | 3    | 3    | 3    |      |      |      |
| CO3  | 3    | 2    | 3    | 3    |     | 3    | 3    | 3    |     |      | 2    |      |      | 3    | 3    | 3    |      |      |      |
| CO4  | 3    | 1    | 3    | 3    |     | 3    | 3    | 3    |     |      | 1    |      |      | 3    | 3    | 3    |      |      |      |
| CO5  | 3    | 2    | 3    | 3    |     | 3    | 3    | 3    |     |      | 2    |      |      | 3    | 3    | 3    |      |      |      |
| CO6  | 3    | 2    | 3    | 3    |     | 3    | 3    | 3    |     |      | 2    |      |      | 3    | 3    | 3    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 3.00 | 1.50 | 3.00 | 3.00 |     | 3.00 | 3.00 | 3.00 |     |      | 1.50 |      |      | 3.00 | 3.00 | 3.00 |      |      |      |



**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

Course Name: GENERIC ELECTIVE COURSE-1

Course Code: BOTPGEC01T

Topic Name: INSTRUMENTATION

| CO, PO & PSO Mapping |       |  |                                 |               |              |
|----------------------|-------|--|---------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level<br>Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Acquire the knowledge about molecular biology, genomics, proteomics, forward and reverse genetics.                                 | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO2   | Study structural and computational analysis and statistical studies in data based analysis.  | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO3   | Learn biophysical approaches, and radiolabeling techniques, among other techniques utilised in biology.                            | L2<br>Understanding             | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO4   | Exhibit the methodologies for analysing issues and designing experiments to prepare students for working in a research laboratory. | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO5   | Handle various instruments for advanced research .   | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      | CO6   | Explore themselves for CSIR/UGC NET and similar other examinations.  | L3<br>Applying                  | 1,2,3,4,6,7,8 | 1,4,5,6      |
|                      |       |  |                                 |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 3    | 3    | 2    |     | 1    | 2    | 3    |     |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
| CO2  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
| CO3  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 3    |      |      |      |
| CO4  | 3    | 3    | 3    | 3    |     | 3    | 2    | 3    |     |      | 2    |      |      | 2    | 2    | 3    |      |      |      |
| CO5  | 3    | 2    | 3    | 3    |     | 3    | 3    | 3    |     |      | 2    |      |      | 2    | 2    | 3    |      |      |      |
| CO6  | 3    | 3    | 3    | 3    |     | 3    | 3    | 3    |     |      | 3    |      |      | 3    | 2    | 2    |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 3.00 | 2.83 | 3.00 | 2.83 |     | 2.67 | 2.67 | 3.00 |     |      | 2.67 |      |      | 2.67 | 2.00 | 2.83 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

**Course Name:** ABILITY ENHANCEMENT COURSE-1  
**Course Code:** BOTPAEC01M  
**Topic Name:** UNDERSTANDING AND PRESENTING SCIENTIFIC LITERATURE

| CO, PO & PSO Mapping |       |  |                              |                 |              |
|----------------------|-------|--|------------------------------|-----------------|--------------|
| Course Outcome:      | SI No | Course outcome   | Knowledge level Blooms Level | POs Mapping     | PSOs mapping |
|                      | CO1   | Understand about journals and publishers in plant sciences and related disciplines, citation indexes, tools for literature searches, different bibliographic format, plagiarism etc. | L2 Understanding             | 1,2,3,4,6,7,8   | 1,5          |
|                      | CO2   | Distinguish between open access and peer reviewed journals.  | L3 Applying                  | 1,3,4,6,7,8     | 5            |
|                      | CO3   | Develop habit of reading current review/research papers, understanding, and discussion among other students.   | L4 analysing                 | 1,2,3,4,5,6,7,8 | 1,4,5,6      |
|                      | CO4   | Learn how bibliographic formatting can be done using proprietary software like End Note or other open source ones, use of MS word.   | L2 Understanding             | 1,3,4,6,7,8     | 5,6          |
|                      | CO5   | Know about Power Point presentation.   | L2 Understanding             | 1,3,4,6,7,8     | 5,6          |
|                      | CO6   | Improve presentation skill of scientific topics using ICT tools with the tips and guidance of teachers.  | L3 Applying                  | 1,3,4,6,7,8     | 5,6          |
|                      |       |  |                              |                 |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5  | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 3    | 1    | 3    | 3    |      | 3    | 3    | 3    |     |      | 1    |      |      |      | 3    |      |      |      |      |
| CO2  | 3    |      | 3    | 3    |      | 3    | 3    | 3    |     |      |      |      |      |      | 3    |      |      |      |      |
| CO3  | 3    | 1    | 3    | 3    | 3    | 3    | 3    | 3    |     |      | 1    |      |      | 2    | 3    | 2    |      |      |      |
| CO4  | 3    |      | 3    | 3    |      | 3    | 3    | 3    |     |      |      |      |      |      | 3    | 3    |      |      |      |
| CO5  | 3    |      | 3    | 3    |      | 3    | 3    | 3    |     |      |      |      |      |      | 3    | 3    |      |      |      |
| CO6  | 3    |      | 3    | 3    |      | 3    | 3    | 3    |     |      |      |      |      |      | 3    | 3    |      |      |      |
|  |      |      |      |      |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 3.00 | 1.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |     |      | 1.00 |      |      | 2.00 | 3.00 | 2.75 |      |      |      |

**BARASAT GOVERNMENT COLLEGE**  
**Course Outcome or Learning Outcome**  
**Two year M.Sc. Degree Course**  
**Under CBCS semester system**  
**POST GRADUATE DEPARTMENT OF BOTANY**  
**With effect from the session: 2019 – 2020**

Course Name: SKILL ENHANCEMENT COURSE-1

Course Code: BOTPSEC01T

Topic Name: BIODIVERSITY AND CONSERVATION

| CO, PO & PSO Mapping |       |   |                              |               |              |
|----------------------|-------|---|------------------------------|---------------|--------------|
| Course Outcome:      | SI No | Course outcome  | Knowledge level Blooms Level | POs Mapping   | PSOs mapping |
|                      | CO1   | Understand of the concept and principle of biodiversity science, causes as well as current crisis, and consequences of biodiversity loss.                       | L2 Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4      |
|                      | CO2   | Develop awareness regarding various means of restoration and sustainable utilization of biodiversity.   | L3 Applying                  | 1,2,3,4,6,7,8 | 1,2,3,4,5    |
|                      | CO3   | Study viable solutions to a range of societal challenges and provides an effective tool to bridge the knowledge gap for sustainable management of biodiversity. | L2 Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5    |
|                      | CO4   | Study various conservation techniques to minimize biodiversity loss.  | L2 Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4,5    |
|                      | CO5   | Explore the linkages between biodiversity conservation, ecosystem services, climate change and sustainable livelihood.  | L3 Applying                  | 1,2,3,4,6,7,8 | 1,2,3,4      |
|                      | CO6   | Know the different organisations like UNESCO, IUCN etc. for better management of biodiversity and conservation.   | L2 Understanding             | 1,2,3,4,6,7,8 | 1,2,3,4      |
|                      |       |   |                              |               |              |

| Program Articulation Matrix (CO-PO Matrix) |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| PO, PSO<br>CO                              | PO1  | PO2  | PO3  | PO4  | PO5 | PO6  | PO7  | PO8  | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 |
| CO1  | 2    | 2    | 2    | 1    |     | 1    | 1    | 2    |     |      | 2    | 3    | 3    | 2    |      |      |      |      |      |
| CO2  | 2    | 2    | 2    | 2    |     | 2    | 2    | 2    |     |      | 2    | 3    | 3    | 2    | 1    |      |      |      |      |
| CO3  | 1    | 1    | 2    | 1    |     | 1    | 1    | 2    |     |      | 1    | 3    | 3    | 1    | 1    |      |      |      |      |
| CO4  | 3    | 2    | 3    | 2    |     | 3    | 1    | 3    |     |      | 2    | 3    | 3    | 3    | 2    |      |      |      |      |
| CO5  | 2    | 2    | 3    | 3    |     | 2    | 2    | 2    |     |      | 2    | 3    | 3    | 2    |      |      |      |      |      |
| CO6  | 2    | 3    | 1    | 1    |     | 1    | 3    | 1    |     |      | 3    | 3    | 3    | 2    |      |      |      |      |      |
|  |      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
| Average                                    | 2.00 | 2.00 | 2.17 | 1.67 |     | 1.67 | 1.67 | 2.00 |     |      | 2.00 | 3.00 | 3.00 | 2.00 | 1.33 |      |      |      |      |