Program Outcome (PO) and Course Outcome (CO) under LOCF (CBCS)

Program Offered: MSc in CONSERVATION BIOLOGY

Program Outcomes (PO)	
PO1:	Comprehensive Understanding of Biodiversity: Graduates will gain in-depth knowledge of biodiversity, its levels, threats, and conservation strategies, including in-situ and ex-situ methods.
PO2:	Ecological Principles and Applications: Students will develop a strong foundation in ecological principles, including population, community, and evolutionary ecology, and their applications in conservation.
PO3:	Proficiency in Research Techniques: Graduates will acquire skills in research methodologies, including field studies, laboratory techniques, and statistical analysis, to assess and monitor biodiversity.
PO4:	Environmental Management Skills: Students will learn to manage natural resources sustainably, assess environmental impacts, and apply restoration ecology principles.
PO5:	Knowledge of Conservation Policies and Laws: Students will become familiar with national and international conservation laws, policies, and ethical considerations in biodiversity protection.
PO6:	Technological Proficiency: Graduates will gain expertise in bioinformatics, GIS, and remote sensing tools for biodiversity analysis and conservation planning.
PO7:	Problem-Solving and Decision-Making: Graduates will develop critical thinking and decision-making skills to address complex conservation challenges and implement effective solutions.

SEMESTER: I

COURSE OUTCOMES (CO)			
Sl No.	**Course Name**	**Course Code**	**Course Outcomes(CO)**
1	Biogeography and Bioresources I	MSCCONBC101	**CO1**:Identify flora and fauna based on the knowledge of taxonomy and systematic **CO2**: Demonstrate a similarity with major bio-geographic realms, species distribution and ecosystem functions **CO3**: Apply taxonomic methods to classify species (both flora and fauna) **CO4**: Classify different communities and forest based on basic idea about resource and its use **CO5**: Analyze different social issues related to conservation and later apply them to conservation measures in future
2	Natural Interactions I	MSCCONBC102	**CO1**: Define and outline the different components of environment **CO2**: Analyze levels of pollution and environmental crisis **CO3**: Apply similarity between theory and natural threats of pollution **CO4**: Classify different communities' health hazards and their ecotoxic effects on nature **CO5**: Identify issues related to degradation of nature and

			natural resources **CO6**: Outline the different climatic changes associated with global climate chemistry
3	Biomes and Resources	MSCCONBC103	**CO1**: Classify wetlands in global and Indian perspective **CO2**: Analyze threats and probable measures of conservation of different ecosystems **CO3**: Outline the concept of marine and desert ecosystem **CO4**: Classify different resources and identify the cause of their depletion **CO5**: Apply the knowledge for increasing productivity of ecosystems **CO6**: Create different methods for sustainable use of resources and stop overexploitation
4	Ecological Principles	MSCCONBC104	**CO1**: Demonstrate similarity in theoretical and natural populations **CO2**: Analyze growth patterns of populations and communities **CO3**: Apply molecular genetics in biodiversity conservation **CO4**: Classify different microbial communities and their role in natural ecosystem **CO5**: Compare different behavioral and survival strategies of natural communities **CO6**: Analyze different mating types and demonstrate sexual selection processes
5	Biogeography and Bioresources II	MSCCONBC105	**CO1**:Calculate and compare log volume of tree species for economic valuation of forest ecosystem **CO2**:Create vegetation maps based on ecological and phonological associations **CO3**:Apply molecular genetics in biodiversity conservation **CO4**:Demonstrate different ecosystem components from field studies **CO5**:Calculate different diversity indices for biodiversity evaluation **CO6**:Summarize and compare theoretical studies with natural environment through field visits to different forest, aquatic ecosystems etc
6	Natural Interactions II	MSCCONBC106	**CO1**:Calculate different water parameters through titrimetric methods **CO2**:Estimate ascorbic acid and analyze APTI **CO3**:Calculate and estimate different soil parameters using field-based equipment **CO4**:Demonstrate diverse instruments like UV-spectrophotometer, colorimeter, pH meter, DO meter, titration equipment, multi-parameter tester etc. **CO5**:Summarize, compare and validate theoretical case studies with natural environment through laboratory visits

SEMESTER:II

COURSE OUTCOMES (CO)			
Sl No.	**Course Name**	**Course Code**	**Course Outcomes (CO)**
1	Chemistry in Natural Management	MSCCONBC201	**CO1**: Apply the knowledge on wastewater treatment and management **CO2**: Identify the diverse methods of solid waste treatment **CO3**: Analyze and apply different biocatalyst **CO4**: Categorize different green reactions and apply them for green synthesis **CO5**: Analyze health hazards and their remedy
2	Biological Rarity Phenomena	MSCCONBC202	**CO1**: Categorize rare species and protected areas **CO2**: Classify and understand different strategies for reproductive methods and its conservation **CO3**: Analyze the genetics behind inbreeding and outbreeding and their role in conservation **CO4**: Outline the concept of metapopulation and its application in species prioritization and conservation **CO5**: Identify and analyze methods of population viability analysis and its application in Minimum Viable population estimation
3	Biodiversity Conservation I	MSCCONBC203	**CO1**: Apply the knowledge on biodiversity for use and value assessment **CO2**: Identify the levels and threats of biodiversity and wildlife **CO3**: Classify different megadiverse countries and hotspots **CO4**: Classify and analyze different endangered and endemic species **CO5**: Analyze and assess different diverse conservation strategies
4	Chemistry of Biosphere I	MSCCONBC204	**CO1**: Demonstrate biosphere and its components **CO2**: Analyze and assess global climate change and threats **CO3**: Classify hydrosphere and analyze challenges related to it and ways of its conservation **CO4**: Classify lithosphere and analyze challenges related to it and ways of its conservation **CO5**: Categorically calculate and analyze the problems related to global climate change and probable remedies
5	Biodiversity Conservation II	MSCCONBC205	**CO1**: Calculate and compare different species diversity indices using field techniques like point count, line transect **CO2**: Create vegetation maps based on ecosystem studies **CO3**: Identify species based on skull, dentition and pellets **CO4**: Calculate and identify species based on pellets and scat **CO5**: Calculate vegetation cover based on plot less vegetation count **CO6**: Summarize and compare theoretical studies with natural environment through field visits to different forest, aquatic ecosystems etc.
6	Chemistry of Biosphere II	MSCCONBC206	**CO1**: Calculate and different water parameters through spectrophotometric methods **CO2**: Estimate chlorophyll and analyze APTI **CO3**: Calculate and estimate different water parameters using titrimetric and spectrophotometric methods **CO4**: Analyze and identify heavy metals in polluted water

			bodies. **CO5**: Summarize and compare theoretical studies with natural environment through industrial visits to different sericulture, aquaculture farms, coal mines or power plants etc.

SEMESTER: III

COURSE OUTCOMES (CO)			
Sl No.	**Course Name**	**Course Code**	**Course Outcomes (CO)**
1	Natural Resource Management	MSCCONBC301	**CO1**: Identify different ecotourism methods and apply the knowledge in wildlife conservation **CO2**: Generate and apply different assessment methods of environment like EIA, SIA, SEA etc. **CO3**: Analyze and apply different restoration methods to conserve and restore ecosystems **CO4**: Categorize, analyze and identify different social issues related to environment and conservation **CO5**: Apply and implement different environmental laws in natural and social environment
2	Wildlife Management	MSCCONBC302	**CO1**: Apply basic knowledge of health hazards and its control in captive and wild animals **CO2**: Classify and categorize different diseases and their remedy to wildlife health **CO3**Analyze and demonstrate different monitoring methods, capture methods and also use of these methods in real systems **CO4**: Generate awareness for illegal trade and formulate strategies for its prevention **CO5**: Identify and analyze different captive breeding strategies through case studies and real life situations
3	Quantification Techniques I	MSCCONBC303	**CO1**: Apply different statistics like correlation, regression, ANOVA in real system data **CO2**: Analyze and apply mathematical and simulations models for systems ecology **CO3**: Apply different census methods for data generation and knowledge on species count **CO4**: Assess different sampling technique and quantify and correlate theoretical data with field data **CO5**: Identify diverse quantifying techniques for data analysis
4	Quantification Techniques II	MSCCONBC304	**CO1**: Calculate and generate data on tree height and log content for economic purpose in forestry **CO2**: Demonstrate behavioral studies and apply them in field **CO3**: Construct ethogram and display different behaviors of animals based on time and space **CO4**: Identify natural marking and droppings in field to identify a species **CO5**: Apply the knowledge of pugmarks and use it to identify species from pugmark studies **CO6**: Demonstrate and use different equipment like radio collars, tags, dart guns etc. used for wildlife capture and monitoring
5	Forest Wealth I	MSCCONBCMJE301	**CO1**: Generate idea about various forest types **CO2**: Classify and identify different forest types and forest covers

			CO3: Identify sylvicultural important tree species **CO4**: Apply the knowledge of medicinal plants in ethno-medicinal treatments **CO5**: Identify different plant animal interactions and its role in ecosystem conservationetc.
6	Forest Wealth II	MSCCONBMJE302	**CO1**: Litterfall estimation of forest floor analysis **CO2**: Classify and identify medicinal plants and weeds **CO3**: Identify sylviculturally important tree species **CO4**: Calculate and identify various forest types. **CO5**: Classify tree species into functional groups
7	Wetland Conservation I	MSCCONBMJE303	**CO1**: Generate an overview of wetland and its importance **CO2**: Classify wetland types both at global and national level especially in context to India **CO3**: Generate idea on geomorphic, hydrologic and other services of wetlands **CO4**: Apply the knowledge of Ramsar Sites for wetland conservation **CO5**: Generate idea on wetland productivity and its use based on water chemistry and relation to wildlife
8	Wetland Conservation II	MSCCONBMJE304	**CO1:** Identify flora and fauna associated with wetlands **CO2**: Calculate and measure heavy metals in wetlands to understand level of pollution **CO3**: Create spatial distribution maps based on PQV method **CO4**: Measure wetland biomass and understand wetland macrophyte adaptation and ecology **CO5**: Study of IVI and ecological indices of wetland flora
9	Marine Bioresources I	MSCCONBMJE307	**CO1**: Overview of marine systems in India and compare it to global scenario **CO2**: Classify and identify different marine environments based on its chemistry and stratification **CO3**: Apply knowledge of ocean currents for navigation and species distribution patterns in marine environment **CO4**: Apply the knowledge water and soil chemistry for conservation of marine systems **CO5**: Analyze the extent of marine pollution and propose conservation measures for the same
10	Marine Bioresources II	MSCCONBMJE308	**CO1:** Identify marine plankton **CO2:** Identify and classify coastal flora and fauna **CO3**: Analyze various vegetation pattern of ocean floor and drift **CO4**: Classify tree species near marine environment

SEMESTER: IV

COURSE OUTCOMES (CO)			
Sl No.	**Course Name**	**Course Code**	**Course Outcomes (CO)**
1	Bioinformatics and Computer Application	MSCCONBC401	**CO1**: Analyze sequence of nucleic acids using bioinformatics **CO2**: Generate and apply different software tools for accession of nucleic acid and protein database **CO3**: Apply data retrieval methods for database analysis **CO4**: Categorize, analyze and identify different species based on protein and nucleic acid **CO5**: Understand the evolutionary aspects of phenetics and cladistics

2	Biostatistics and Bioinstrumentation	MSCCONBC402	**CO1**:Apply basic knowledge of statistics in biology **CO2**:Classify and categorize different sampling methods for biological samples **CO3**:Analyze and demonstrate measures of central tendency **CO4**:Generate idea on working principles of different lab-based techniques **CO5**:Understand the microscopic techniques and apply the same in live and preserved sample identification **CO6**:Learn and apply different bioinstrumentation methods like spectrometer, fluorescence, NMR, X-ray crystallography in analysis of biological samples of wild life
3	Dissertation	MSCCONBC403	**CO1**: Apply different field techniques in real field **CO2**: One year field based/lab-based study will enable students to categorize, analyze different aspects of ecosystem **CO3**: Apply different census methods for data generation and knowledge on species count **CO4**: Assess different sampling technique and quantify and correlate theoretical data with field data **CO5**: Identify diverse quantifying techniques for data analysis
4	Bioinformatics, Biostatistics and Computer Application	MSCCONBC404	**CO1**: Calculate and generate data using different software **CO2**: Demonstrate diversity index calculation in field works **CO1**: Construct mathematical models using filed generated data **CO3**: Identify software for different statistical analysis **CO4**: Apply the GIS software for generation of geo-spatial maps for species distribution **CO5**: Demonstrate and use different software like STELLA, RAMSAR, SPSS
5	Forest Wealth III	MSCCONBCMJE401	**CO1**: Create habitat maps using QGIS **CO2**: Calculate APTI to understand air pollution stress of forest **CO3**: Identify important endemic and threatened species of forests **CO4**: Identify various parasites associated with forest flora and fauna **CO5**: Calculate IVI of forest flora
6	Forest Wealth IV	MSCCONBMJE402	**CO1**: Litterfall estimation of forest floor analysis **CO2**: Classify and identify medicinal plants and weeds **CO3**: Identify sylviculturally important tree species **CO4**: Calculate and identify various forest types. **CO5**: Classify tree species into functional groups **CO6**: Study various forest types, their composition through filed surveys
7	Wetland Conservation III	MSCCONBMJE403	**CO1**: Apply the knowledge to identify wetland flora and fauna **CO2**: Classify wetland types especially mangrove and swamp **CO3**: Generate idea on wetland services **CO4**: Apply the knowledge of phytoremediation in wetland restoration **CO5**: Generate idea on wetland weeds and its role in ecosystem restoration **CO6**: Apply the knowledge of constructed wetland to help conserve deteriorated wetland through process of restoration **CO7**: Apply the wetland related conservation laws through case studies
8	Wetland Conservation IV	MSCCONBMJE404	**CO1:** Calculate phytoremediation and restoration values

			CO2: Learn the phytoremediation capacity of wetland macrophyte using Cr as one heavy metal **CO3**: Create spatial maps with QGIS **CO4**: Learn various biological features of wetland dependent fauna **CO5**: Identify coastal wetland flora and fauna **CO6**: Analyze community indices based on plankton study **CO7**: Simulate and compare wetlands through field surveys
9	Marine Bioresources III	MSCCONBMJE407	**CO1:** Overview of marine seaweed and coral **CO2:** Classify and identify different marine parasites and apply the knowledge in field **CO3:** Apply knowledge of different marine aquaculture methods **CO4:** Identify different methods of marine bio-resource utility **CO5:** Generate idea about marine birds and animals
10	Marine Bioresources IV	MSCCONBMJE408	**CO1:** Calculate community indices of marine community **CO2:** Calculate water and soil parameters **CO3:** Measure different physico-chemical factors of marine flora **CO4:** Calculate carbon content of marine environments **CO5:** Compare different marine systems through case studies and field visits

Durgapur Government College

Mapping/Co-relation Program Outcome(PO) & Course Outcome(CO)

Department : Conservation Biology Academic Session : 2024-25

CO details	PO details							
Sl. No.	Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7
1.	MSCCONBC101	✓	✓		✓	✓	✓	✓
2.	MSCCONBC102	✓	✓	✓	✓		✓	✓
3.	MSCCONBC103	✓	✓	✓	✓	✓	✓	✓
4.	MSCCONBC104	✓	✓	✓	✓		✓	✓
5.	MSCCONBC105	✓	✓	✓	✓	✓		✓
6.	MSCCONBC106	✓	✓	✓	✓	✓	✓	✓
7.	MSCCONBC201	✓	✓	✓	✓	✓	✓	✓
8.	MSCCONBC202	✓	✓	✓	✓	✓	✓	✓
9.	MSCCONBC203	✓		✓	✓	✓	✓	✓

10.	MSCCONBC204	✓	✓	✓	✓	✓		✓
11.	MSCCONBC205	✓	✓	✓	✓	✓	✓	✓
12.	MSCCONBC206	✓	✓	✓	✓		✓	✓
13.	MSCCONBC301	✓	✓	✓	✓	✓		✓
14.	MSCCONBC302	✓	✓	✓	✓	✓	✓	✓
15.	MSCCONBC303	✓		✓	✓			✓
16.	MSCCONBC304	✓	✓	✓	✓	✓	✓	✓
17.	MSCCONBCMJE301	✓	✓	✓		✓	✓	✓
18.	MSCCONBMJE302	✓	✓	✓	✓	✓	✓	✓
19.	MSCCONBMJE303	✓	✓	✓	✓	✓	✓	✓
20.	MSCCONBMJE304	✓	✓	✓	✓		✓	✓
21.	MSCCONBMJE307	✓	✓	✓	✓	✓		✓
22.	MSCCONBMJE308	✓	✓	✓	✓	✓	✓	✓
23.	MSCCONBC401	✓	✓	✓	✓	✓	✓	✓
24.	MSCCONBC402	✓		✓	✓	✓	✓	✓
25.	MSCCONBC403	✓	✓	✓	✓	✓		✓
26.	MSCCONBC404	✓	✓	✓	✓	✓	✓	✓
27.	MSCCONBCMJE401	✓	✓	✓	✓		✓	✓
28.	MSCCONBMJE402	✓	✓	✓	✓	✓		✓
29.	MSCCONBMJE403	✓	✓	✓	✓	✓	✓	✓
30.	MSCCONBMJE404	✓		✓	✓			✓
31.	MSCCONBMJE407	✓	✓	✓	✓	✓	✓	✓
32.	MSCCONBMJE408	✓	✓	✓	✓		✓	✓