

The M.Sc. course in Conservation Biology at Durgapur Govt. College was started in the year 2007 to impart training in the field of conservation science and to further the cause of wildlife conservation in India and elsewhere.

Learning Outcome of PG Dept. Of Conservation Biology

SEMESTER 1

Paper MSCCONBC101

At the end of this course the students will be able to

1. Identify flora and fauna based on the knowledge of taxonomy and systematic
2. Demonstrate a similarity with major bio-geographic realms, species distribution and ecosystem functions
3. Apply taxonomic methods to classify species (both flora and fauna)
4. Classify different communities and forest based on basic idea about resource and its use
5. Analyze different social issues related to conservation and later apply them to conservation measures in future

Paper MSCCONBC102

At the end of this course the students will be able to

1. Define and outline the different components of environment
2. Analyze levels of pollution and environmental crisis
3. Apply similarity between theory and natural threats of pollution
4. Classify different communities' health hazards and their ecotoxic effects on nature
5. Identify issues related to degradation of nature and natural resources
6. Outline the different climatic changes associated with global climate chemistry

Paper MSCCONBC103

At the end of this course the students will be able to

1. Classify wetlands in global and Indian perspective
2. Analyze threats and probable measures of conservation of different ecosystems
3. Outline the concept of marine and desert ecosystem
4. Classify different resources and identify the cause of their depletion
5. Apply the knowledge for increasing productivity of ecosystems
6. Create different methods for sustainable use of resources and stop overexploitation

Paper MSCCONBC104

At the end of this course the students will be able to

1. Demonstrate similarity in theoretical and natural populations
2. Analyze growth patterns of populations and communities
3. Apply molecular genetics in biodiversity conservation
4. Classify different microbial communities and their role in natural ecosystem
5. Compare different behavioral and survival strategies of natural communities
6. Analyze different mating types and demonstrate sexual selection processes

Paper MSCCONBC105

At the end of this course the students will be able to

1. Calculate and compare log volume of tree species for economic valuation of forest ecosystem
2. Create vegetation maps based on ecological and phonological associations
3. Apply molecular genetics in biodiversity conservation
4. Demonstrate different ecosystem components from field studies
5. Calculate different diversity indices for biodiversity evaluation
6. Summarize and compare theoretical studies with natural environment through field visits to different forest, aquatic ecosystems etc

Paper MSCCONBC106

At the end of this course the students will be able to

1. Calculate different water parameters through titrimetric methods
2. Estimate ascorbic acid and analyze APTI
3. Calculate and estimate different soil parameters using field based equipments
4. Demonstrate diverse instruments like UV-spectrophotometer, colorimeter, pH meter, DO meter, titration equipments, multi-parameter tester etc
5. Summarize, compare and validate theoretical case studies with natural environment through laboratory visits

SEMESTER 2

Paper MSCCONBC201

At the end of this course the students will be able to

1. Apply the knowledge on wastewater treatment and management
2. Identify the diverse methods of solid waste treatment
3. Analyze and apply different biocatalyst
4. Categorize different green reactions and apply them for green synthesis
5. Analyze health hazards and their remedy

Paper MSCCONBC202

At the end of this course the students will be able to

1. Categorize rare species and protected areas
2. Classify and understand different strategies for reproductive methods and its conservation
3. Analyze the genetics behind inbreeding and outbreeding and their role in conservation
4. Outline the concept of metapopulation and its application in species prioritization and conservation
5. Identify and analyze methods of population viability analysis and its application in Minimum Viable population estimation

Paper MSCCONBC203

At the end of this course the students will be able to

1. Apply the knowledge on biodiversity for use and value assessment
2. Identify the levels and threats of biodiversity and wildlife
3. Classify different megadiverse countries and hotspots
4. Classify and analyze different endangered and endemic species
5. Analyze and assess different diverse conservation strategies

Paper MSCCONBC204

At the end of this course the students will be able to

1. Demonstrate biosphere and its components
2. Analyze growth patterns of populations and communities
3. Analyze and assess global climate change and threats
4. Classify hydrosphere and analyze challenges related to it and ways of its conservation
5. Classify lithosphere and analyze challenges related to it and ways of its conservation
6. Categorically calculate and analyze the problems related to global climate change and probable remedies

Paper MSCCONBC205

At the end of this course the students will be able to

1. Calculate and compare different species diversity indices
2. Create vegetation maps based on ecosystem studies
3. Identify species based on skull, dentition and pellets
4. Calculate and identify species based on pellets and scat
5. Calculate vegetation cover based on plot less counting
6. Summarize and compare theoretical studies with natural environment through field visits to different forest, aquatic ecosystems etc

Paper MSCCONBC206

At the end of this course the students will be able to

6. Calculate and different water parameters through spectrophotometric methods
7. Estimate chlorophyll and analyze APTI
8. Calculate and estimate different water parameters using titrimetric methods
9. Analyze and identify heavy metals in polluted water bodies
10. Summarize and compare theoretical studies with natural environment through industrial visits to different sericulture, aquaculture farms, coal mines or power plants etc

SEMESTER 3

Paper MSCCONBC301

At the end of this course the students will be able to

1. Identify different ecotourism methods and apply the knowledge in wildlife conservation
2. Generate and apply different assessment methods of environment like EIA, SIA, SEA etc
3. Analyze and apply different restoration methods to conserve and restore ecosystems
4. Categorize, analyze and identify different social issues related to environment and conservation
5. Apply and implement different environmental laws in natural and social environment

Paper MSCCONBC302

At the end of this course the students will be able to

1. Apply basic knowledge of health hazards and its control in captive and wild animals
2. Classify and categorize different diseases and their remedy to wildlife health
3. Analyze and demonstrate different monitoring methods, capture methods and also use of these methods in real systems
4. Generate awareness for illegal trade and formulate strategies for its prevention
5. Identify and analyze different captive breeding strategies through case studies and real-life situations

Paper MSCCONBC303

At the end of this course the students will be able to

1. Apply different statistics like correlation, regression, ANOVA in real system data
2. Analyze and apply mathematical and simulations models for systems ecology
3. Apply different census methods for data generation and knowledge on species count
4. Assess different sampling technique and quantify and correlate theoretical data with field data
5. Identify diverse quantifying techniques for data analysis

Paper MSCCONBC304 (Core Practical)

At the end of this course the students will be able to

1. Calculate and generate data on tree height and log content for economic purpose in forestry
2. Demonstrate behavioral studies and apply them in field
3. Construct ethogram and display different behaviors of animals based on time and space
4. Identify natural marking and droppings in field to identify a species
5. Apply the knowledge of pugmarks and use it to identify species from pugmark studies
6. Demonstrate and use different equipment like radio collars, tags, dart guns etc used for wildlife capture and monitoring

Paper MSCCONBMJE301 (Forest Wealth I)

At the end of this course the students will be able to

1. Generate idea about different forest types
2. Classify and identify different forest types and forest covers
3. Identify silviculturally important tree species
4. Apply the knowledge of medicinal plants in ethno-medicinal treatments
5. Identify different plant animal interactions and its role in ecosystem conservation

Paper MSCCONBMJE302 (Forest Wealth II- Major Practical)

At the end of this course the students will be able to

1. Construct vegetation maps based on spatial distribution
2. Classify and identify medicinal plants and weeds
3. Identify silviculturally important tree species
4. Estimate chlorophyll and ascorbic acid for APTI determination
5. Calculate species value index (SVI) in order to prioritize species for conservation

Paper MSCCONBMJE303 (Wetland Conservation I)

At the end of this course the students will be able to

1. Generate an overview of wetland and its importance
2. Classify wetland types both at global and national level especially in context to India
3. Generate idea on geomorphic, hydrologic and other services of wetlands
4. Apply the knowledge of Ramsar Sites for wetland conservation
5. Generate idea on wetland productivity and its use based on water chemistry and relation to wildlife

Paper MSCCONBMJE304 (Wetland Conservation II- Major Practical)

At the end of this course the students will be able to

1. Calculate water parameters of wetland
2. Measure soil parameters and productivity of wetland
3. Identify flora and fauna associated with wetlands
4. Generate conservation rules based on wetland law and implement them in real situations
5. Simulate and compare wetlands through field surveys

Paper MSCCONBMJE307 (Marine Bioresource I)

At the end of this course the students will be able to

1. Overview of marine systems in India and compare it to global scenario
2. Classify and identify different marine environments based on its chemistry and stratification
3. Apply knowledge of ocean currents for navigation and species distribution patterns in marine environment
4. Apply the knowledge water and soil chemistry for conservation of marine systems
5. Analyze the extent of marine pollution and propose conservation measures for the same

Paper MSCCONBMJE308 (Marine Bioresource II- Major Practical)

At the end of this course the students will be able to

1. Identify marine flora and fauna
2. Calculate water and soil parameters
3. Identify coastal flora of India
4. Identify marine plankton
5. Compare different marine systems through case studies and field visits

SEMESTER 4

Paper MSCCONBC401

At the end of this course the students will be able to

1. Analyze sequence of nucleic acids using bioinformatics
2. Generate and apply different software tools for accession of nucleic acid and protein database
3. Apply data retrieval methods for database analysis
4. Categorize, analyze and identify different species based on protein and nucleic acid
5. Understand the evolutionary aspects of phenetics and cladistics

Paper MSCCONBC402

At the end of this course the students will be able to

1. Apply basic knowledge of statistics in biology
2. Classify and categorize different sampling methods for biological samples
3. Analyze and demonstrate measures of central tendency
4. Generate idea on working principles of different lab based techniques
5. Understand the microscopic techniques and apply the same in live and preserved sample identification
6. Learn and apply different bioinstrumentation methods like spectrometer, fluorescence, NMR, X-ray crystallography in analysis of biological samples of wild life

Paper MSCCONBC403

At the end of this course the students will be able to

1. Apply different field techniques in real field
2. One year field based/lab based study will enable students to categorize, analyze different aspects of ecosystem
3. Apply different census methods for data generation and knowledge on species count
4. Assess different sampling technique and quantify and correlate theoretical data with field data
5. Identify diverse quantifying techniques for data analysis

Paper MSCCONBC404 (Core Practical)

At the end of this course the students will be able to

1. Calculate and generate data using different software
2. Demonstrate diversity index calculation in field works
3. Construct mathematical models using field generated data
4. Identify software for different statistical analysis
5. Apply the GIS software for generation of geo-spatial maps for species distribution
6. Demonstrate and use different software like STELLA, RAMSAR, SPSS

Paper MSCCONBMJE401 (Forest Wealth III)

At the end of this course the students will be able to

1. Generate idea about different insect and classify and identify them
2. Classify and identify different microbes and problems related to them
3. Identify economically important entomo-fauna of forests
4. Categorize different bio-geographical zones based on herpetofauna and avifauna diversity
5. Categorize and identify mammalian species of forest ecosystem

Paper MSCCONBMJE402 (Forest Wealth IV- Major Practical)

At the end of this course the students will be able to

1. Analyze litter and forest floor dynamics
2. Classify and identify endemic forest species
3. Identify threatened species of forest ecosystem
4. Categorize and identify forest parasites and parasites of wild fauna and propose remedial measures
5. Calculate the species distribution index and create faunal distribution maps

Paper MSCCONBMJE403 (Wetland Conservation III)

At the end of this course the students will be able to

1. Apply the knowledge to identify wetland flora and fauna
2. Classify wetland types especially mangrove and swamp
3. Generate idea on wetland services
4. Apply the knowledge of phytoremediation in wetland restoration
5. Generate idea on wetland weeds and its role in ecosystem restoration
6. Apply the knowledge of constructed wetland to help conserve deteriorated wetland through process of restoration
7. Apply the wetland related conservation laws through case studies

Paper MSCCONBMJE404 (Wetland Conservation IV- Major Practical)

At the end of this course the students will be able to

1. Calculate phytoremediation and restoration values
2. Measure removal capacities of wetland macrophytes and weeds
3. Measure wetland productivity
4. Identify coastal wetland flora and fauna
5. Simulate and compare wetlands through field surveys

Paper MSCCONBMJE407 (Marine Bioresource III)

At the end of this course the students will be able to

1. Overview of marine seaweed and coral
2. Classify and identify different marine parasites and apply the knowledge in field
3. Apply knowledge of different marine aquaculture methods
4. Identify different methods of marine bio-resource utility
5. Generate idea about marine birds and animals

Paper MSCCONBMJE408 (Marine Bioresource IV- Major Practical)

At the end of this course the students will be able to

1. Calculate community indices of marine community
2. Calculate water and soil parameters
3. Measure different physico-chemical factors of marine flora
4. Calculate carbon content of marine environments
5. Compare different marine systems through case studies and field visits