

# **M.Sc. Environmental Science Curriculum**

**W.E.F. June -2011**

## **Semester III**

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| <b>11. Environmental Monitoring Techniques</b>                   | <b>70 Marks</b>  |
| <b>12. Environmental Management System and Risk Assessment</b>   | <b>70 Marks</b>  |
| <b>13. Environmental Laws. Policies and Public Participation</b> | <b>70 Marks</b>  |
| <b>14. Elective Paper (From EES 09-12)</b>                       | <b>70 Marks</b>  |
| <b>15. <i>Practical :III &amp; Industrial Tour</i></b>           | <b>120 Marks</b> |

## **Semester IV**

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| <b>16. Major Project (Master's Thesis)</b> | <b>400 Marks</b> |
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The students will carry out this project work in the Department of Life Science under the guidance of any faculties of the department or in collaboration with any Institute of State/National level repute, any Industry or Govt. Orgation.

However one faculty member of the Department of Life Sciences shall remain as a co-guide.

**List of elective papers :**

<b>EES-01</b>	<b>Conservation Biology and Wildlife Management (CBEM)</b>
<b>EES-02</b>	<b>Environmentally Sustainable Technologies (EST)</b>
<b>EES-03</b>	<b>Conservation and Restoration of Degraded Ecosystems (CRD)</b>
<b>EES-04</b>	<b>Conservation and Management of Marine Environment (CMM)</b>
<b>EES-05</b>	<b>Water and Waste Water Management (WRM)</b>
<b>EES-06</b>	<b>Solid waste Wastes and their management (SWM)</b>
<b>EES-07</b>	<b>Biodiversity Research, Monitoring and Management (BRM)</b>
<b>EES-08</b>	<b>Applied eco-informatics (AEI)</b>
<b>EES-09</b>	<b>Industrial Safety and Management (ISM)</b>
<b>EES-10</b>	<b>Conventional Energy and Carbon Offset Management (CEC)</b>
<b>EES-11</b>	<b>Eco-tourism and Conservation (ETC)</b>
<b>EES-12</b>	<b>Environmental Communication and Conflict Resolution(ECC)</b>

**Semester III**

**ES 301**

**Environmental monitoring Techniques**

**Section: I**

**Unit 1          Monitoring of Abiotic Environment**

- **Standards for environmental quality assessment and monitoring**
- **Monitoring Protocols for Soil, Water and Air according to Indian Standards**
- **Monitoring ambient environment of industrial and domestic zones**
- **Monitoring non degradable elements in the environment**

**Unit 2          Monitoring and Assessment of Biotic Environment**

- **Monitoring ecosystems and biological diversity: Birds and Mammalian diversity**
- **Indicator species in the ecosystem and their monitoring**
- **Monitoring streams, wetland, rangeland and other man made ecosystems**
- **Monitoring marine environment**

**Section: II**

**Unit 3          Monitoring Toxicity in the Environment**

- **Basics of Toxicology: Introduction, Scope and Significance**
- **Toxic elements and their fate in the environment**
- **Toxicity measurement techniques (Toxicological Analysis)**
- **Detoxification: Methods, Applications and Significance**

**Unit 4          Advanced Monitoring Techniques and Documentation**

- **Monitoring and managing domestic and industrial Wastes**
- **Applying RS and GIS in environmental monitoring**
- **Bio-degradation and bio-deterioration of recalcitrant compounds**
- **Preparation of Environment Monitoring Report**

**Section: I**

**Unit 1 Introduction of EMS**

- **Overview of Environmental Management System (EMS)**
- **EMS Audits and its significance**
- **Cleaner production (CP) management and its significance in EMS**
- **Planning and Preparing an EMS report**

**Unit 2 Environmental Impact Assessment and Auditing**

- **Concept, Process and Evaluation methodology**
- **Methods for EIA**
- **Preparation of EIA statements**
- **Concept of environmental audit**
- **Setting up an audit programme and Carrying out environmental audits**

**Section: II**

**Unit 3 Environmental Risks**

- **Basics, Definitions, Scope and significance of Studying Environmental Risks**
- **Evaluation of Risks, Risk Assessments and Risk Communication**
- **Hazard identification, Assessment and Control Techniques**
- **Legislations on safety and health in India**

**Unit 4 Environment and Disasters: Management and mitigation**

- **Definition, types of disasters, and their impact on man and environment**
- **Natural disasters and their management**
- **Man made disasters, their impact and solutions.**

- Disaster management, relief operations, role of administration and NGO, emergency supply and rehabilitation

**ES 303      *Environmental Laws, Policies and Public Participation***

***Core Paper***

**Section: I**

**Unit 1 Environmental Laws**

- Factory Act (1948)
- Environmental Protection Act (1986)
- Air pollution and prevention Act (1981)
- Forest Act (1927) and Wildlife (Protection) Act (1972)

**Unit 2 Environmental Case Laws**

- Bhopal Gas case
- Shri Ram Food and Fertilizer case
- M.C. Mehta Vs Union of India case (Ganga pollution case)
- Narmada Bachao case

**Section: II**

**Unit 3 Communication techniques for Environment Conservation and Management**

- Communication basics and Concept of Environment Communication
- Fund raising protocols and Grant writing process for environmental issues
- Stakeholder consultation process, Messaging, Advocacy and behavioral change
- Rio Earth Summit: Convention on Nation's Biodiversity, UN convention on climatic change

**Unit 4 Environmental Education**

- Background, goals, objectives, guided principles of Environmental Education
- Strategies for development: authorization, EE methodologies, and EE modeling
- Environmental movements in India, Eco-tourism, Eco-development and environmental ethics

- **Nature Education Camps and their impact evaluation on environment**

***ES 304 Elective Paper (From EES 09-12)***

**EES-09 Industrial Safety and Management (ISM)**

**EES-10 Conventional Energy and Carbon Offset Management (CEC)**

**EES-11 Eco-tourism and Conservation (ETC)**

**EES-12 Environmental Communication and Conflict Resolution (ECC)**

## **Semester IV      Project Work (Masters' Thesis)**

**The student will carry out this project work in the Department of Life Science under the guidance of any faculty of the department OR in collaboration with any Institute of State/ National repute, any Industry, Govt. or Non Govt. Organization. However in such case, one faculty member of the Department of Life Sciences shall remain as a co-guide.**

**Student shall have to carry out Original Research Work OR Undergo industrial training with a specific Project/ Task for minimum of three months without break and submit a master's Thesis. He/She also need to give a presentation (Open house oral presentation of the work) during the Viva Voce examination to be conducted at the university campus only.**

**The Thesis shall be evaluated by the panel of three examiners as follow:**

- 1.      External Examiner**
- 2.      Thesis supervisor or Co-Guide of Internal Examiner**

**Same panel will also remain present at the time of presentation.**

### **The distribution of Marks for M.Sc. Dissertation**

<b>1.      Masters' Thesis</b>	<b>150</b>
a.      Internal Evaluation : 75	
b.      External Evaluation : 75	
<b>2.      Viva- voce</b>	<b>050</b>
<b>3.      Presentation</b>	<b>050</b>
<b>        Total</b>	<b>300</b>

### **Distribution of Marks in Sem IV :**

<b>1. Project work</b>	<b>300</b>
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<b>2. General Viva</b>	<b>050</b>
<b>3. Regularity and Performance</b>	<b>050</b>