# 19MC2101 - ENVIRONMENTAL SCIENCES

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Category:** |  Mandatory course | **Credits:** | 0 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 2-0-0 |
| **Prerequisite:** | Basic idea on environment, Environmental pollution causes, effects and control measures. | **Sessional Evaluation:****Univ. Exam Evaluation:****Total Marks:** | 4060100 |
| **Objectives** | * To know the importance of Environmental Sciences and understand the various components of environment.
* To know the value of natural resources and need to protect them.
* To know the value of biodiversity and it`s conservation methods.
* To describe advanced methods to solve problems related to environmental pollution.
* To understand the social issues and provide plans to minimize the problems.
* To articulate various environmental acts in order to protect the environment.
 |

|  |  |
| --- | --- |
| **Course Outcomes** | Upon successful completion of the course, the students will be able to: |
| CO1 | Know the importance of Environmental sciences and understand the various components of environment. |
| CO2 | Understand the value of natural resources |
| CO3 | Summarize the function of ecosystem, values of biodiversity and conservation. |
| CO4 | Identify how the environment is polluted and suggest the mitigation measures. |
| CO5 | Understand the environmental problems in India and way to minimize the effects. |
| CO6 | Categorize the environmental protection laws in our country and role of information technology in environment protection. |
| **Course Content** | UNIT-I**Multidisciplinary nature of environmental sciences:** Introduction, Definition, Scope and Importance of Environmental Sciences, Various Components of Environment, Atmosphere, Lithosphere, Hydrosphere and Biosphere, Multidisciplinary Nature of Environmental Sciences.UNIT-II**Natural Resources:****Land Resources:** Importance, Land Degradation, Soil Erosion and Desertification, Effects of Modern Agriculture (Fertilizer and Pesticide Problems).**Forest Resources:** Use and Over, Exploitation, Mining and Dams, Their Effects on Forest and Tribal People.**Water Resources:** Use and Over, Utilization of Surface and Ground Water, Floods and Droughts.**Energy Resources:** Renewable and Non-Renewable Energy, Need to use of Alternate Energy Sources, Impact of Energy use on Environment.UNIT-III**Ecosystem:** Definition, Types, Structure (Biotic and Abiotic Components) and Functions of an Ecosystem, Energy Flow, Food Chain, Food Web, Ecological Pyramids and Ecological Succession.**Bio-Diversity and its Conservation:** Definition-Genetic, Species and Ecosystem Diversity, Value of Biodiversity, Hotspots of Biodiversity in India, Threats to Biodiversity, In Situ and Ex Situ Conservation of Biodiversity.UNIT-IV**Environmental Pollution:** Causes, Effects and Control Measures of Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution and Nuclear Hazards.**Solid Waste Management:** Causes, Effects and Control Measures of Urban and Industrial Waste. **Disaster Management:** Floods, Earthquake and Cyclones.UNIT-V**Social Issues and Environment:** From Unsustainable to Sustainable Development, Urban Problems Related to Energy, Water Conservation, Rainwater Harvesting and Water Shed Management.**Case Studies:** Silent Valley Project, Madhura Refinery and Tajmahal, Tehri Dam, Kolleru Lake Aquaculture and Fluorosis in Andhra Pradesh, Climate Change, Global Warming, Acid Rain and Ozone Depletion.UNIT-VI**Human Population And Environment:** Population Growth, Variation Among Nations and Population Explosion, Role of Information Technology in Environment and Human Health. **Environmental Acts:** Water (Prevention and Control of Pollution) Act, Air (Prevention and Control of Pollution) Act, Wildlife Protection Act and Forest Conservation Act.**Field Work:** Visit to Local Area Having River/Forest/Grass Land/Hill/Mountain to Document Environmental Assets. |
| **Text Books and References:** | Text Books:1. “Environmental science and Engineering” by AnubhaKaushik and C.P.Kaushik, New Age International publishers. Sixth Edition 2018.
2. “Environmental science and Engineering”by N. Arumugam,VKumaresan, Saras Publication; 2 edition (2014).
 |
| Reference Books:1. “Introduction to Environmental science” by Y.Anjaneyulu, B.S Publications.2004.
2. Perspectives in Environmental Studies, AnubhaKaushik and C.P.Kaushik, New Age International publishers, Third Edition2019.
3. “Environmental science” by M.Chandrasekhar, Hi-Tech Publications. 2009.
 |
| **E-Resources** | 1. <https://nptel.ac.in/courses>
2. <https://freevideolectures.com/university/iitm>
 |