**20MC2201-ENVIRONMENTAL SCIENCE**

**(Common to CE, EEE, ME&ECE)**

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| **Course Category:** | Mandatory course | **Credits:** | 0 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 3-0-0 |
| **Prerequisite:** | Basic idea on environment, Environmental pollution causes, effects and control measures. | **Sessional Evaluation:**  **Semester End Exam. Evaluation: Total Marks:** | 40  60  100 |

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| **Objectives** | 1. To know the importance of Environmental Sciences and understand the various components of environment. 2. To know the value of natural resources and need to protect them. 3. To know the value of biodiversity and it`s conservation methods. 4. To describe advanced methods to solve problems related to environmental pollution. 5. To understand the social issues and provide plans to minimize the problems. 6. To articulate various environmental acts in order to protect the environment. | |
| **Course Outcomes** | Upon successful completion of the course, the students will 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: Fundamentals of environmental science  Introduction, Definition, Scope and Importance of environmental science - Various components of environment – Atmosphere, lithosphere, hydrosphere and biosphere – Multidisciplinary nature of environmental science-public awareness.  **UNIT-II: Natural resources**  Introduction- Classification of Natural resources.  **Forest Resources**: Importance of Forests, over-exploitation of forest resources-Deforestation-causes, effects and control methods.  **Water Resources:** Use and over-utilization of surface and ground water – Dams -Benefits and problems-conflicts over water.  **Energy resources:** Renewable and non-renewable energy sources. Need to use of alternate energy sources, Impact of energy use on environment.  **Land resources:** Importance, Land degradation, Soil erosion and desertification.  UNIT-III: Ecosystem and Bio-diversity  **Ecosystem**: Definition, types, structure of ecosystem (biotic and abiotic components) and functions of an Ecosystem – Energy flow, Food chains, 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 – conservation of biodiversity ( In-situ and Ex-situ conservation).  UNIT-IV: Environmental Pollution  **Environmental Pollution:** Introduction,Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution and nuclear hazards.    **Solid waste management**: sources, effects of Municipal solid waste, Industrial solid waste and management of solid waste.    **Disaster management:** Floods, Droughts, earthquakes and cyclones.  UNIT-V: Social issues and the Environment  **Social issues and The Environment:** From unsustainable to sustainable development, urban problems related to energy, water conservation, rainwater harvesting and water shed management.    **Climate change-** Global warming, Acid rain and Ozone layer depletion.  **Environmental Acts:** Water (Prevention and control of pollution) Act-Air (Prevention and control of pollution) Act – Wildlife protection Act and Forest conservation Act  .  UNIT-VI: Human population and the Environment  Human population and Environment: Population growth, variation among nations and population Explosion- Role of information technology in environment and human health.  **Case Studies:** Silent valley project, Madhura Oil Refinery and Taj Mahal, Kolleru Lake Aquaculture and Fluorosis in Andhra Pradesh  **Field work:** Visit to a Local Area having river/Forest/grass land/hill/mountain to document environmental assets. Study of common plants, insects and birds. | |
| **Text Books and References:** | **Text Books:**   1. Environmental Studies by E. Bharucha (2003), University Publishing Company, New Delhi. 2. “Environmental science” by Anubha Kaushik and C.P .Kaushik.(2016), New age International Private Limited. 3. “Environmental science and Engineering” by P.Anandan and R.K. Kumaravelan.(2009), Scitech Publishers. 4. Environmental Studies by K.V.S.G.Murali Krishna(2015), Savera Publishing House   **Reference Books:**   1. “Introduction to Environmental science” by Y. Anjaneyulu. 2. “Environmental studies” by Dr .B.S. Chauhan. 3. “Environmental science” by M. Chandrasekhar. 4. Environmental Studies by P.N,Palini swamy, P.Manikandan, A.Geeta and K.Manjula Rani, Pearson Education, Chennai. | |
| **E-Resources** | 1. <https://nptel.ac.in/courses> 2. <https://freevideolectures.com/university/iitm> | |