**Techno India NJR Institute of Technology**



Environmental Engineering and Disaster Management

**(Subject Code: 7AG6-60.2)**

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**Course Overview:**

Student will learn basics of EE & DM from this 40-hour course. They will be able to protect public health by preserving and enhancing the environment. They are engaged in designing various pollution control equipment and devices, construction, installation, implementation and operation of environmentally related procedures. For example, they design the water management and water waste systems which clean our water and eliminate dangerous bacteria and viruses. New research helps environmental engineers develop new ways to improve our life.

EE & DM is the basic requirement for the job role of Environment engineer in the companies like Aquatec and enviro privet etc. Most of the questions asked during the placement drive for the EVS Company are created from this subject.

**Course Outcomes:**

|  |  |  |
| --- | --- | --- |
| **CO. NO.** | **Cognitive Level** | **Course Outcome** |
| 1 | Analysis | Analyse characteristics of water and wastewater. |
| 2 | Application | Estimate the quantity of drinking water and domestic wastewater generated. |
| 3 | Design | Design components of water supply systems. |
| 4 | Design | Accumulate the information about water supply fittings. |
| 5 | Synthesis | Calculate physical chemical properties by lab experiments for sewage sample. |

**Prerequisites:**

1. Analyse characteristics of water and wastewater

2. Calculate the quantity of drinking water and domestic wastewater generated

3. Illustrate the several types of water demands

4. Demonstrate an integrative approach to environmental issues with a

focus on sustainability

5. Illustrate environmental information to both technical and non-technical audiences

**Course Outcome Mapping with Program Outcome:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Outcome** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO472.1** | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 3 |
| **CO472.2** | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 3 | 3 |
| **CO472.3** | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 3 | 3 |
| **CO472.4** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| **CO472.5** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| **CO472 (AVG)** | 2.6 | 2 | 2 | 2 | 2 | 2 | 1.6 | 1 | 2 | 1.4 | 1.8 | 1.8 | 2 | 2 | 2.2 |

**Course Coverage Module Wise:**

|  |  |  |
| --- | --- | --- |
| Lecture No. | Unit | Topic |
| 1 | 1 | Introduction: Objective, scope and outcomes of course. |
| 2 | 2 | Safe water supply:  Introduction of safe water. |
| 3 | 2 | Importance of safe water system. |
| 4 | 2 | Domestic water requirements for urban. |
| 5 | 2 | Domestic water requirements for Rural. |
| 6 | 2 | Important water sources. |
| 7 | 2 | Intake of water sources. |
| 8 | 2 | transportation and supply of water |
| 9 | 2 | Revision of the chapter |
| 10 | 2 | Class test of the chapter. |
| 11 | 3 | Drinking water quality: Introduction of pure water. |
| 12 | 3 | Quality of drinking water. |
| 13 | 3 | Indian standard quality of drinking water. |
| 14 | 3 | Introduction of water treatment plant. |
| 15 | 3 | Types of water treatment methods. |
| 16 | 3 | Characteristics of pure water. |
| 17 | 3 | Importance of sanitation. |
| 18 | 3 | Introduction of sanitation |
| 19 | 3 | Revision of the chapter. |
| 20 | 3 | Class test of the chapter. |
| 21 | 4 | Domestic wastewater: Introduction. |
| 22 | 4 | Quantity of domestic wastewater. |
| 23 | 4 | Characteristics of wastewater. |
| 24 | 4 | Disposal of wastewater in urban. Urban. |
| 25 | 4 | Disposal of wastewater in rural. |
| 26 | 4 | Introduction of sewer. |
| 27 | 4 | types of sewers |
| 28 | 4 | Discharge and Hydraulic design of sewer. |
| 29 | 4 | Introduction to domestic wastewater treatment. |
| 30 | 4 | Revision of the chapter. |
| 31 | 5 | Solid waste: Introduction. |
| 32 | 5 | Quantity of solid waste. |
| 33 | 5 | Characteristics of solid waste. |
| 34 | 5 | Disposal of solid waste in urban and rural. |
| 35 | 5 | Introduction of Air pollution and type of pollutants. |
| 36 | 5 | Properties and effects of pollutants on living beings. |
| 37 | 5 | BIS standard of pollutants of air and their abetment. |
| 38 | 5 | Introduction of various disaster. |
| 39 | 5 | Importance of disaster management and revision. |
| 40 | 5 | Class test of the chapter. |

**Course Level Problems (Test Items):**

|  |  |
| --- | --- |
| **CO.NO.** | **Problem description** |
| **1** | 1. Write about importance of safe water in detail 2. Write about Requirement of safe water in urban area. 3. Write about sources of drinking water 4. Write a short note on Transportation of water 5. Write about Requirement of safe water in Rural area. |
| **2** | 1. Write a note on Indian Standards water quality 2. Write about introduction of water treatment 3. Write a note on importance Sanitation 4. Explain in detail Drinking water quality |
| **3** | 1 Explain in detail the Characteristics of domestic waste  2 How we will disposal Wastewater in Urban area  3 How we will disposal Wastewater in Rural area  4 Explain in detail Different types of Severs  5 Write a note on Domestic Wastewater Treatment |
| **4** | 1 Explain in detail the Characteristics of Solid waste  2 Write a note on Disposal of Solid waste in urban area  3 Explain in detail BIS standards for pollutant in Air and noise  4 Write a note on Importance Disaster Management  5 Write a note on Types of Pollutants in detail |

**Assessment Methodology:**

1. Practical exam in lab where they have to write Tests Related to the Quality of Water and Sewage . (Once in a week)
2. Assignments one from each unit.
3. Midterm subjective paper where they have to write About all Study Of Environmental Engineering (Twice during the semester)
4. Final paper at the end of the semester subjective.

**Teaching and Learning resources unit-wise:**

**Unit-1**

**Water**

Video Tutorials <https://www.youtube.com/watch?v=LiL0_sfdhQ0>

Water Quality

<https://www.youtube.com/watch?v=ZHYvoSF_BKk>

Water Supply System

<https://www.youtube.com/watch?v=b4stML-Mt9s>

Water Treatment

<https://www.youtube.com/watch?v=6u9L0nVUYPY>

**Theory concepts**

Water Quality

<https://www.who.int/water_sanitation_health/resourcesquality/wqachapter1.pdf>

Water Supply System

<https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture-notes/env-health-science-students/ln-water-supply-i-final.pdf>

Water Treatment <https://web.iitd.ac.in/~arunku/files/CVL100/L8.pdf>

Sample Quiz: <https://www.ruvival.de/water-quantity-quality-quiz/>

<https://www.objectivebooks.com/2018/03/exam-test-questions-on-water-supply.html>

**Unit 2**

**Water quality**

Video Tutorials <https://www.youtube.com/watch?v=LiL0_sfdhQ0>

Water Quality

<https://www.youtube.com/watch?v=ZHYvoSF_BKk>

Water Supply System

<https://www.youtube.com/watch?v=b4stML-Mt9s>

Water Treatment

<https://www.youtube.com/watch?v=6u9L0nVUYPY>

Theory concepts

Water Quality

<https://www.who.int/water_sanitation_health/resourcesquality/wqachapter1.pdf>

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Water Treatment <https://web.iitd.ac.in/~arunku/files/CVL100/L8.pdf>

Sample Quiz: <https://www.ruvival.de/water-quantity-quality-quiz/>

<https://www.objectivebooks.com/2018/03/exam-test-questions-on-water-supply.html>

**Unit 3**

**Waste water**

Video Tutorials <https://www.youtube.com/watch?v=-clXHOKhfmA>

Quantity of Sewage

<https://www.youtube.com/watch?v=pW3kB285_Ig>

Sewage Characteristics

<https://www.youtube.com/watch?v=z2l3_RSucqg>

waste water Disposal and Reuse

<https://www.youtube.com/watch?v=cNiy1kR-W74>

Theory concepts: <https://nptel.ac.in/courses/105/104/105104102/>

Quantity of Sewage

<https://www.youtube.com/watch?v=pW3kB285_Ig>

Sewage Characteristics

<https://www.youtube.com/watch?v=z2l3_RSucqg>

waste water Disposal and Reuse

<https://www.youtube.com/watch?v=cNiy1kR-W74>

Sample Quiz: <https://www.objectivebooks.com/2016/04/waste-water-engineering-mcq-practice.html>

**Unit 4**

**Solid waste Management**

Video Tutorials <https://www.youtube.com/watch?v=k0ktJRoRcOA>

Theory concepts: <https://ec.europa.eu/echo/files/evaluation/watsan2005/annex_files/WEDC/es/ES07CD.pdf>

Sample Quiz: <https://olc.worldbank.org/node/39614/take>