

# Techno India NJR Institute of Technology



## Course File

Environmental Engineering and Disaster  
Management

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

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**Department of CE**

For Techno India N.J.R. Institute of Technology  
पंकज पोखरण  
Dr. Pankaj Kumar Porwal  
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# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Open Electives Syllabus

B. Tech.: IV Year- VII & VIII Semester

## 7AG6-60.2 : Environmental Engineering and Disaster Management

Credit: 3

Max. Marks: 150(IA:30, ETE:120)

3L+0T+0P

End Term Exam: 3 Hours

| SN | Contents  | Hours     |
|----|---|-----------|
| 1  | Introduction: Objective, scope and outcome of the course.<br>(This compulsory for all course )  | 01        |
| 2  | Importance of safe water supply system. Domestic water requirements for urban and rural areas. Sources of Water supply. Intakes and transportation of water.  | 09        |
| 3  | Drinking water quality. Indian Standards of drinking water. Introduction to water treatment for safe drinking, Importance of sanitation.  | 10        |
| 4  | <i>Domestic waste water</i> : quantity, characteristics, disposal in urban and rural areas. Sewer: types, design discharge and hydraulic design. Introduction to domestic wastewater treatment.   | 10        |
| 5  | <i>Solid waste</i> : quantity, characteristics and disposal for urban and rural areas. Introduction to air pollution. Types of pollutants, properties and their effects on living beings. BIS standards for pollutants in air and their abetments. Introduction to various disaster, Importance of disaster management. | 10        |
|    | <b>Total</b>  | <b>40</b> |

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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        | Student will be able to Analyse characteristics of water and wastewater  |
| 2      | Application     | Student will be able to Calculate the quantity of drinking water and domestic wastewater generated.  |
| 3      | Design          | Student will be able to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.                    |
| 4      | Design          | Student will be able to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.  |
| 5      | Synthesis       | Student will be able to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. |

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### 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:

| Environmental Engineering and Disaster Management |     |     |     |     |     |     |         |     |     |      |         |         |      |         |      |
|---|-----|-----|-----|-----|-----|-----|---------|-----|-----|------|---------|---------|------|---------|------|
| 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 (AVG)                                       | 3   | 2   | 2   | 2   | 2   | 2   | 1.33333 | 1   | 2   | 1    | 1.66667 | 1.66667 | 2    | 2.66667 | 3    |

### 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.                             |

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|    |   |  |
|----|---|--|
| 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. |

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|----|---|--|
| 37 | 5 | BIS standard of pollutants of air and their abatement. |
| 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      | <ol style="list-style-type: none"> <li>1. Write about importance of safe water in detail</li> <li>2. Write about Requirement of safe water in urban area.</li> <li>3. Write about sources of drinking water</li> <li>4. Write a short note on Transportation of water</li> <li>5. Write about Requirement of safe water in Rural area.</li> </ol> |
| 2      | <ol style="list-style-type: none"> <li>1. Write a note on Indian Standards water quality</li> <li>2. Write about introduction of water treatment</li> <li>3. Write a note on importance Sanitation</li> <li>4. Explain in detail Drinking water quality</li> </ol>  |
| 3      | <ol style="list-style-type: none"> <li>1 Explain in detail the Characteristics of domestic waste</li> <li>2 How we will disposal Wastewater in Urban area</li> <li>3 How we will disposal Wastewater in Rural area</li> <li>4 Explain in detail Different types of Severs</li> <li>5 Write a note on Domestic Wastewater Treatment</li> </ol>     |

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|   |   |
|---|---|
|   |   |
| 4 | <p>1 Explain in detail the Characteristics of Solid waste</p> <p>2 Write a note on Disposal of Solid waste in urban area</p> <p>3 Explain in detail BIS standards for pollutant in Air and noise</p> <p>4 Write a note on Importance Disaster Management</p> <p>5 Write a note on Types of Pollutants in detail</p> |

### 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](https://www.youtube.com/watch?v=LiL0_sfdhQ0)

Water Quality

[https://www.youtube.com/watch?v=ZHYvoSF\\_BKk](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

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Water Quality

[https://www.who.int/water\\_sanitation\\_health/resourcesquality/wqachapter1.pdf](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](https://www.youtube.com/watch?v=LiL0_sfdhQ0)

Water Quality

[https://www.youtube.com/watch?v=ZHYvoSF\\_BKk](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](https://www.who.int/water_sanitation_health/resourcesquality/wqachapter1.pdf)

Water Supply System

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<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 3

#### Waste water

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

Quantity of Sewage

[https://www.youtube.com/watch?v=pW3kB285\\_Ig](https://www.youtube.com/watch?v=pW3kB285_Ig)

Sewage Characteristics

[https://www.youtube.com/watch?v=z2l3\\_RSucqg](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](https://www.youtube.com/watch?v=pW3kB285_Ig)

Sewage Characteristics

[https://www.youtube.com/watch?v=z2l3\\_RSucqg](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>

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## 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](https://ec.europa.eu/echo/files/evaluation/watsan2005/annex_files/WEDC/es/ES07CD.pdf)

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

Previous Year Question Papers:

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