

# Techno India NJR Institute of Technology



## Environmental Engineering and Disaster Management

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

Bhupendra purohit  
(Assistant Professor)  
**Department of CE**

For Techno India NJR Institute of Technology  
पंकज पौरवाल  
Dr. Pankaj Kumar Porwal  
(Principal)



# 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. (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	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

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### 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.

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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.

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36	5	Properties and effects of pollutants on living beings.
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	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
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### 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

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[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

<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)

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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

<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)

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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>

## 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>

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पंकज पोरवाल  
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