



Kot Bhalwal, Jammu

Model Institute of Engineering
& Technology (Autonomous)
Course Handout

COURSE HANDOUT

ENVIRONMENT ENGINEERING (CE-403)

B.E. (CE) - 4TH SEMESTER

ACADEMIC YEAR (2024-25)

Mr. Ishan Anand

Assistant Professor

Department of Civil Engineering



Department of Civil Engineering

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

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Dr. Arun K. Gupta Teaching-Learning Centre

Version 1.1



Please Do Not Print Unless Necessary



Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
CE-403	Environment Engineering	ESC	4	4	0	0	50	100	150

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Understand the scope of environmental engineering.
CO2	Perform the raw water treatment of various tanks.
CO3	Use optimization techniques for generation and estimation of community sewage.
CO4	Learn different treatment process in sewage, sewerage treatment plant.
CO5	Design different sewage treatment units and their application.

Unit-I

Water Sources: Definition and scope of environmental engineering, surface and ground water sources, selection and development of sources. Water supply systems: Municipal water demands and demand variations, population forecasting and water demand estimations, intakes and transmission systems, pipes for transporting water and their design.

(8 Hours)

Unit-II

Water quality: Physical, chemical and biological water quality parameters, water quality index, water quality standards, classification of water bodies. Water treatment schemes, basic principles of water treatment, design of plain sedimentation, coagulation and flocculation, filtration – slow, rapid and pressure, disinfection units. Data and background information for the design of water supply system.

(8 Hours)

Unit-III

Sewerage system: Generation and estimation of community sewage, flow variations, storm water flow, alternate systems for sewage collection and conveyance, design of sewers, characterization of sewage: parameters for characterization, sampling, testing and analysis of sewage, relative stability and population equivalent, BOD and BOD kinetics.

(10 Hours)

Unit-IV

Treatment of sewage: Effluents standards, basic principles of sewage treatment, introduction to unit operations and processes - primary treatment units such as screening, grit chamber, and sedimentation tanks. Secondary treatment units such as different types of aerobic suspended and attached growth systems, and tertiary treatment sludge handling and disposal – thickening, stabilization, dewatering, drying and disposal.

(10 Hours)

Unit-V

Sewage treatment units design: ASP, TF, stabilization ponds. Treated effluent disposal: Disposal into surface water bodies, reuse for irrigation and aqua-culturing, land disposal, disposal through injection into groundwater. Indian standards for disposal of effluent. Low cost sanitation systems-Imhoff tanks, septic tank, stabilization ponds, oxidation ponds, and constructed wetland systems.

(10 Hours)



Textbooks

S.No.	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Environmental Engineering	Ministry of Urban Development	Affiliated east-west Press	4 th (2001)
2	Water Supply and Sewerage	S.K. Garg	Khanna Publishers	9 th (2019)
3	Introduction to Environmental Engineering	M.L Davis and Corn Well	McGraw Hill Publishing	5 th (2020)
4	Environmental Engineering	S.K. Garg	Khanna Publishers	7 th (2019)

Reference Books

S.No.	Name of the Books	Name of the Author	Publisher Name	Edition (Pub. Yr.)
1	Environmental Engineering	Peavy, Rowe and Tchobanglous	McGraw Hill Publishing	4 th (2012)
2	Manual on sewerage and sewage treatment	Ministry of Urban Development	Ministry of Urban Development	5 th (2016)

COURSE PLAN

Unit-I Water Sources and its Supply System

S.No	Topics	Recommended Books
1	Scope of Environmental Engineering.	Book 2, Ch.1
2	Surface and ground water sources.	Book 2, Ch.3
3	Selection and development of sources.	Book 2, Ch.3
4	Water supply systems.	Book 2, Ch.1
5	Municipal water demands and demand variations.	Book 2, Ch.2
6	Population forecasting and water demand estimations.	Book 2, Ch.2
7	Intakes and transmission systems	Book 2, Ch.2
8	Pipes for transporting water and their design.	Book 2, Ch.3
Unit-II Water Quality and its Treatment		
9	Physical, chemical and biological water quality parameters.	Book 2, Ch.8
10	Water quality index, water quality standards.	Book 2, Ch.8
11	Classification of water bodies.	Book 2, Ch.8
12	Water treatment schemes, basic principles of water treatment.	Book 2, Ch.8
13	Design of plain sedimentation	Book 2, Ch.9



14	Coagulation and flocculation.	Book 2, Ch.9
15	Filtration – slow, rapid and pressure, disinfection units.	Book 2, Ch.9
16	Data and background information for the design of water supply system.	Book 2, Ch.9
Unit-III Sewage System		
17	Generation and estimation of community sewage.	Book 4, Ch.2
18	Flow variations	Book 4, Ch.2
19	Alternate systems for sewage collection and conveyance.	Book 4, Ch.2
20	Design of sewers.	Book 4, Ch.4
21	Characterization of sewage.	Book 4, Ch.4
22	Parameters for characterization of Sewage.	Book 4, Ch.5
23	Sampling, testing of Sewage	Book 4, Ch.5
24	BoD Kinetics.	Book 4, Ch.5
25	Analysis of Sewage	Book 4, Ch.5
26	Storm water flow Characteristics.	Book 4, Ch.5
Unit-IV Sewage Treatment Systems		
27	Basic principles of sewage treatment	Book 4, Ch.11
28	Introduction to unit operations and processes - primary treatment units such as screening.	Book 4, Ch.11
29	Grit chamber and sedimentation tanks.	Book 4, Ch.11
30	Secondary treatment units such as different types of aerobic suspended.	Book 4, Ch.11
31	Tertiary treatment sludge handling	Book 4, Ch.11
32	Locations, – thickening, stabilization, dewatering, drying and disposal.	Book 4, Ch.11
33	Sludge disposal requirements	Book 4, Ch.12
34	Types of treatment of sewage	Book 4, Ch.12
35	Aerobic and Anaerobic Treatment of Sewage	Book 4, Ch.13
36	Quality and characteristics of Sewage	Book 4, Ch.13
Unit-V Design of Sewage Treatment Unit		
37	Sewage treatment units	Book 4, Ch.8
38	Designs Analysis of Sewage Treatment units	Book 4, Ch.8
39	Asp, TF, Stabilization Ponds	Book 4, Ch.9
40	Treated effluent disposal, disposal into surface water bodies	Book 4, Ch.9
41	Reuse for irrigation and aqua-culturing	Book 4, Ch.10
42	Indian standards for disposal of effluents	Book 4, Ch.10
43	Low cost sanitation systems	Book 4, Ch.10
44	Imhoff tanks, septic tanks	Book 4, Ch.10
45	Stabilization ponds, oxidation ponds	Book 4, Ch.10
46	Wetland Systems	Book 4, Ch.16



ADDITIONAL WEB RESOURCES

1.	NPTEL: Video lectures on Water Supply Engineering Lecture series by Prof. Manoj Kumar Tiwari, School of Water Resource, IIT Kharagpur https://archive.nptel.ac.in/noc/courses/105/105/105105201/
2.	NPTEL: Video lectures on Waste Water Engineering Lecture series by Prof. Manoj Kumar Tiwari, Department of Civil Engineering, IIT Kharagpur https://archive.nptel.ac.in/noc/courses/105/105/105105178/

GRADING AND ASSESSMENT

- **Sessional Test:** 20 marks
- **Assignment:** 20 marks
- **Attendance:** 10 marks
- **Final Examination:** 100 marks

COURSE POLICIES

- **Attendance:** Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity:** MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions:** Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**
Monday (12:05 PM - 12:55 PM)
Friday (12:05 PM - 12:55 PM)
- **Contact Information**
ishan.civ@mietjammu.in