

M. Tech. I Semester I

Subject Name: Environmental Sanitation

Subject Code: MTEN14107

Type of course: PE II

Prerequisite: Students should have basic understanding of day to day sanitation & hygiene practices.

Rationale: To understand basic about Environment and Environmental Sanitation, their indoor Quality Standards and regulations. To identify Rural and Industrial Sanitation problems and their Solutions.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	150
3	0	2	4	60	15	25	20	30	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1.	Introduction Principles of protecting the environmental sanitation measures, Communicable diseases, Micro-organisms, Methods of communication, Diseases communicated by discharges of intestines, nose and throat, other communicable diseases and Control of Communicable and certain Noninfectious diseases: Types, agents, Control of Water, Food and Insect borne diseases And zoo noses.	7	16%
2.	Residential and Institutional Environment Appraisal Quality of Living, Hygiene Indices, Health Principles of Housing and its Environment	6	13%
3.	Rural Sanitation Rural areas, Population habits and environmental conditions, problems of water supply and sanitation aspects, low cost excreta disposal systems. Rural sanitation improvement schemes.	7	16%
4.	Indoor Quality Standards Causes and Sources of Indoor Air Pollution Biological Contaminants, Thermal and moisture Requirement; Ventilation.	7	16%
5.	Industrial Sanitation Schools, Public Buildings, Hospitals, Eating establishments, Swimming pools – Study of factors like Light, Heat, Ventilation,	8	16%

	Plumbing fixtures, Cleanliness and maintenance and comfort.		
6.	Radiation Fundamentals Types of radiation Ionizing and Non-Ionizing radiation, their uses and biological effects. Radioactive waste disposal Radioactive substances soil, water and air and their fate. Treatment and disposal Liquid and solid Radioactive Wastes.	10	23%

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	30	20	20	10	10

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels (**Revised Bloom's Taxonomy**)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	Environmental engineering and sanitation	Joseph A. Salvato	Wiley-Blackwell, ISBN-10 : 0471750778 ISBN-13: 978- 0471750772	1972	2 nd
2.	Environmental Sanitation	D. K. Thakur	Discovery publishing house, ISBN-10 : 9350567008 ISBN-13 : 978- 9350567005	2015	1 st
3.	Environmental Sanitation	by K. V. S. G. Murali Krishna	Reem Publications Pvt. Ltd. ISBN-10 : 8183510167 ISBN-13 : 978- 8183510165	2015	1 st
4.	Decentralised	Kush Verma and	Academic	2014	2 nd

	Governance in Water and Sanitation in Rural India	B S Bisht	Foundation ISBN-10 9332701466 ISBN-13 978-9332701465		
5.	Environmental Sanitation, Wastewater Treatment and Disposal	Tanveer Ferdous Saeed Abdullah Al-Muyeed Tanvir Ahmed	University Grants Commission of Bangladesh, ISBN : 978-984-8920-16-9	2014	2 nd
6.	Environmental Sanitation	K. V. S. G. Murali Krisna	ISBN-10 8183510167 ISBN-13 978-8183510165	2012	1 st

Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Understand the different types of Rural and Industrial Sanitation problems, their effects and their control measures. (R & U-Cognitive Level)	20
CO-2	Identify difference between Industrial Hygiene & Occupational Health. (U & N-Cognitive Level)	10
CO-3	Learn about various Indoor Quality Standards and Regulations. (R & U-Cognitive Level)	20
CO-4	Learn the concept of Industrial sanitation. (U-Cognitive Level)	25
CO-5	Understand the basic management of Solid Waste. (U & A-Cognitive Level)	25

FOR LAB SESSIONS:

List of Tasks:

1. Indoor Air Quality of different locations.
2. Examination & Analysis of Municipal Solid Waste Management System.
3. Study of HVAC system of any Industry.

List of Open Source/learning website:

- <https://nptel.ac.in/courses/127/101/127101014/>
 - Introduction to the Environmental Sanitation and Systems
- https://jalshakti-ddws.gov.in/sites/default/files/Rural_Sanitation_Strategy_Report.pdf
 - Rural Sanitation Strategy in India
- https://onlinecourses.nptel.ac.in/noc19_ge29/preview
 - Sustainable & Affordable sanitation systems



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List of Open Source Software:

- AirNow Mobile app
- ChemAlert Mobile app
- MomentumQMS