

Course No
CE 202

Course Name
ENVIRONMENTAL ENGINEERING - I

L-T-P-Credits
(3- 0/1- 0: 3/4)

Prerequisite: nil;

Co requisite: nil

Course Objectives:

1. To emphasize on the importance of Public water supply scheme.
2. To explain the need of Surface and Sub-surface sources of water
3. To elucidate about Population forecasting and estimation of water demand.
4. To compute water quality parameters.
5. To familiarize students about Water Purification systems.
6. To analysis and design water distribution systems.

Course Outcomes:

1. Identify environmental problems arising due to engineering and technological activities and the science behind those problems.
2. Estimate the population - economic growth, energy requirement and demand.
3. Analyse material balance for different environmental systems.
4. Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
5. Identify the major pollutants and abatement devices for environmental management and sustainable development

SYLLABUS

Module	Contents	Hours
	Public Water Supply Scheme	6
I	Objectives, Planning and Components	
	Source of Water	3
II	Surface source - types, selection, storage reservoir – yield and capacity estimation. Sub-surface water - types.	
	Water Demand	5
III	Population forecasting, design period, estimation of water demand for various uses, factors affecting consumption	
	Water Quality	7
IV	The hydrologic cycle and water quality parameters: physical, chemical and biological; water quality requirements and standards.	
	Basic microbiology and chemistry	4
V	Microorganisms in natural water systems, development of dissolved oxygen (DO) sag model, introduction to environmental chemistry	
VI	Water Purification	8
	Type – I and Type – II Settling, Design and operation of Sedimentation tanks, Aeration, Coagulation and Flocculation, design and operation of Filtration units, Disinfection, Hardness Removal, Fluoride and Arsenic Removal, Household Water Treatment Systems, Miscellaneous Methods, Flow-sheets for treatment of surface and sub-surface waters.	
VII	Distribution System	5
	Requirements, Classification, Analysis and Design of distribution systems, Detection and Prevention of leakage	

Essential Readings:

1. Environmental Engineering, Peavy H. S., Rowe D. R. and George Tchobanoglous, McGraw-Hill International, First Edition, 2017
2. Water Supply and Sewerage, McGhee T. J., McGraw-Hill Inc., Sixth Edition, 2007

Supplementary Readings:

1. Introduction to Environmental Engineering, Davis M. L and Cornwell D. A McGraw-Hill, Inc., 5th Edition, 2012
2. Wastewater Engineering- Treatment and Reuse, Metcalf & Eddy (Revised by G. Tchobanoglous, F. L. Burton and H. D. Stensel), Tata McGraw Hill, Fourth Edition, 2010

3. Chemistry for Environmental Engineers, Sawyer C. N., McCarty P. L and Parkin G. F., McGraw- Hill, Fifth Edition, 2002
4. APHA, Standard Methods Examination of Water and Wastewater, American Public Health Association, Washington DC, 1995, 22nd Edition, 2012
5. Manual for Sewer and Sewerage, Central Public Health & Environmental Engineering Organization, Ministry of Housing and Urban Development, Govt. of India, 2013.
6. Manual for water supply and treatment, Central Public Health & Environmental Engineering Organization, Ministry of Housing and Urban Development, Govt. of India, 1999.