



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

ENVIRONMENTAL ENGINEERING								
VII Semester: CE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACEC34	Core	L	T	P	C	CIA	SEE	Total
		3	1	0	4	30	70	100
Contact Classes: 45		Tutorial Classes: 15		Practical Classes: Nil		Total Classes: 60		
Prerequisite: Hydrology and Water Resources Engineering								
I. COURSE OVERVIEW:								
<p>Environmental Engineering is a very popular discipline of engineering that deals with the issues related to the environment. The Environmental Engineers devote themselves finding out renewable sources of energy and solutions to curb pollution and other environmental issues. They work for the sustainable development of the earth and its living organisms. They also make devices for waste and water management in rural and urban areas, improved sanitation system, to stop the water-borne diseases. They study the effects of technological growth on environment such as: the effects of global warming, pollution, reason for shortage of rainfall, acid rain etc. In short, the Environmental Engineers are constantly engaged in maintaining the health of the earth and the living creatures on it; this course also cover the study of construction of oxidation pond, sludge digestion tank, skimming tanks, grit chambers, sedimentation tanks and designing of septic tanks and soak pits.</p>								
II. COURSE OBJECTIVES:								
The students will try to learn:								
<ol style="list-style-type: none"> I. The quality and quantity of drinking water standards and know the demand of water for a particular community II. The basic standards of water and study the procedure for determination III. The conventional process of water and waste water treatment methods, and know the distribution system. 								
III. COURSE SYLLABUS:								
MODULE –I: WATER QUALITY, DEMAND AND SUPPLY (9)								
Protected water supply, population forecasts, design period, water demand, types of demand, factors affecting fluctuations, fire demand, storage capacity, water quality and testing. Drinking water standards. Comparison from quality and quantity and other considerations, intakes, infiltration galleries, confined and unconfined aquifers, distribution systems, requirements, methods and layouts.								
MODULE -II: WATER TREATMENT AND DISTRIBUTION (9)								
Layout and general outline of water treatment units, sedimentation, uniform settling velocity, principles, design factors, surface loading, jar test, optimum dosage of coagulant, coagulation, flocculation, clarifier design, coagulants, and feeding arrangements. filtration, theory, working of slow and rapid gravity filters ,multimedia filters, design of filters, troubles in operation comparison of filters, disinfection, types of disinfection, theory of chlorination chlorine demand and other disinfection treatment methods. distribution systems, types of layouts of distribution systems, design of distribution systems, Hardy Cross and equivalent pipe methods, service reservoirs, joints, valves such as sluice valves, air valves, scour valves and check valves water meters, laying and testing of pipe lines, pump house.								
MODULE -III SEWAGE TREATMENT AND DISPOSAL (9)								
Conservancy and water carriage systems, sewage and storm water estimation, type of concentration, storm water over flows combined flow, characteristics of sewage, cycles of decay, decomposition of sewage, examination of sewage, B.O.D. and C.O.D. equations.								

Design of sewers, shapes and materials, sewer appurtenances manhole, inverted siphon, catch basins, flushing tanks, ejectors, pumps and pump houses, house drainage, components requirements, sanitary fittings, traps, one pipe and two pipe systems of plumbing, ultimate disposal of sewage, sewage farming, dilution.

MODULE -IV WASTEWATER TREATMENT (9)

Lay out and general outline of various units in a waste water treatment plant, primary treatment design of screens, grit chambers, skimming tanks-sedimentation tanks-principles and design of biological treatment, trickling filters, standard and high rate.

MODULE -V DESIGN AND WORKING OF TREATMENT UNITS (9)

Construction and design of oxidation ponds, sludge digestion tanks, factors effecting, design of digestion tank, sludge disposal by drying, septic tanks working principles and design-soak pits. Ultimate disposal of waste water, self-purification of rivers, sewage farming.

IV. TEXT BOOKS:

1. Peavy, Howard S., Donald R. Rowe, and George Tchobanoglous. Environmental engineering. Vol. 2985. New York: McGraw-Hill, 1985.
2. Davis, Mackenzie L., and David A. Cornwell. Introduction to environmental engineering. McGraw-Hill, 2008.
3. Duggal, K. N. "Elements of Environmental Engineering: New Delhi; S." Chand and Company Ltd (2002).
4. Punmia B.C, Ashok Jain Arun Jain, "Water Supply Engineering", Laxmi Publications, Pvt. Ltd., New Delhi, 2004.

V. REFERENCE BOOKS:

1. Garg, Santosh Kumar. Water Supply Engineering: Environmental Engineering. Khanna, 1992.
2. Modi, P. N. Sewage Treatment & Disposal and Waste Water Engineering. Standard Book House, 2008.
3. Garg, Santosh Kumar. Sewage disposal and air pollution engineering. Khanna Publsihers, 2012.

VI. WEB REFERENCES:

1. http://site.iugaza.edu.ps/afoul/files/2010/02/Environmental_book.pdf
2. <https://www.sanfoundry.com/best-reference-books-btech-environmental-engineering/>

VII. E-Text Books:

1. http://site.iugaza.edu.ps/afoul/files/2010/02/Environmental_book.pdf
2. <https://libguides.rowan.edu/com>.