

Course code: Course Title	Course Structure			Pre-Requisite
EN104: Basic Environmental	L	T	P	NIL
	3	1	0	

Course Objective: This course aims at providing fundamentals of environmental engineering and an introduction to the services in environmental engineering. This will enhance student's awareness towards water and wastewater engineering, air and noise pollution and solid waste management and emerging fields in Environmental Engineering.

S. NO	Course Outcomes (CO)
CO1	Explain fundamentals of Environmental Engineering.
CO2	Apply fundamentals of Environmental Engineering to various environmental issues.
CO3	Analyse environment and pollution in each segment of the environment.

CO4	Evaluate environmental services required for water supply and treatment and control of environmental pollution.
CO5	Design various units for treatment of water, wastewater and for control of air and noise pollution.

S. NO	Contents	Contact Hours
UNIT 1	Water Engineering: Water demand and its variations. Population Forecasting, Physical, Chemical and Biological Quality Parameters, Drinking Water Quality Standards, Surface, subsurface, selection and development of sources.	8
UNIT 2	Wastewater Engineering: Wastewater Sources, Flow Rates and variations in flow. Physical, Chemical and Microbiological characteristics of waste water. Effluent disposal and re-use, surface disposal, Disposal into rivers, self-purification, oxygen sag curve.	8
UNIT 3	Water Treatment: Coagulation, mixing, flocculation, Sedimentation, Filtration, gravity and pressure filters. Water softening. Aeration, Disinfection, chlorination. Wastewater Treatment: Physical Treatment, screening, activated sludge, trickling filter, septic tanks, anaerobic sludge digestion, stabilization ponds and aerated lagoons.	8
UNIT 4	Solid Waste Management: Sources and composition. Principal industrial and hazardous solid waste, collection, characteristics and disposal.	8
UNIT 5	Air and Noise Pollution: Major air pollutants, sources and effects, measurement of air quality, criteria and standards, Atmospheric cleansing processes (Natural). Noise pollution standards effects and abatement.	8
TOTAL		40

REFERENCES		
S.No.	Name of Books/Authors/Publishers	Year of Publication / Reprint
1	Howard S. Peavy, Donald R. Rowe, and George Tchobanoglous: Environmental Engineering, McGraw-Hill Series in Water Resources and Environmental Engineering, McGraw-Hill. ISBN: 0071002316, 9780071002318	1984
2	Santosh Kumar Garg, Environmental Engineering (Vol.-I): Water Supply Engineering, Khanna Publishers, ISBN: 9788174091208, 8174091203	1977

3	Santosh Kumar Garg, Environmental Engineering (Vol. II): Sewage Waste Disposal and Air Pollution Engineering ISBN 9788174092304, 8174092304	1979
4	Dr. B.C. Punmia, Ashok Kr. Jain, and Arun Kr. Jain, Environmental Engineering-I: Water Supply Engineering, Laxmi Publications, ISBN: 81-7008-092-4	2016
5	Dr. B.C. Punmia, Ashok Kr. Jain, Environmental Engineering-II: Wastewater Engineering (Including Air Pollution), Laxmi Publications, ISBN: 81-7008-091-6	2016
6	E. W. Steel, and T. J. McGhee, Water Supply and Sewerage, McGraw-Hill. ISBN:9780070609297, 0070609292	1979
7	G. S. Birdie, and J. S. Birdie, Water Supply and Sanitary Engineering (Including Environmental Engineering, Water and Air Pollution, Laws and Ecology), Dhanpat Rai Publisher, ISBN:9788187433798, 8187433795	2010
8	Metcalf & Eddy, George Tchobanoglous, Franklin Burton, H. David Stensel, Wastewater Engineering: Treatment and Reuse, McGraw Hill Education, ISBN 9780070495395.	2002