BACHELORS WITH ENVIRONMENTAL SCIENCE AS MAJOR (CT-2)
7th SEMESTER

EVS722J2 ENVIRONMENTAL SCIENCE_ ENVIRONMENTAL ENGINEERING

CREDITS: (THEORY-4, PRACTICAL -2)

COURSE LEARNING OUTCOME: *The syllabus for an environmental engineering course typically covers a range of topics related to the application of engineering principles to address environmental issues. This course introduces students to the principles and practices of environmental engineering, focusing on the identification, assessment, and design of solutions for environmental challenges. This course shall help students to find solutions for quality issues in air, water and land, which may pose a threat to life. Further the Practicals will strengthen the theoretical concepts and help students to develop practical skills for environmental engineering.*

THEORY (4 CREDITS: 60 HOURS)

UNIT 1. FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING

Scope of environmental engineering; Sewerage and storm water drainage; Ecological sanitation; Green buildings; Green engineering and sustainable practices

UNIT II. WATER SUPPLY ENGINEERING

Overview of public water supply systems; Water distribution systems; Water purification methods for public supply: Screening; Coagulation; Flocculation; Sedimentation; Filtration; Disinfection methods; Advanced treatment processes

UNIT III. WASTEWATER ENGINEERING

Nature and types of wastewater; Wastewater characteristics: physical, chemical and biological; Wastewater treatment methods: primary, secondary, tertiary and advanced; Sludge management; Design of treatment facilities

UNIT IV: AIR AND SOIL ENGINEERING

Concept of ventilation; Air conditioning; Green technologies for air pollution control; Noise control engineering; Soil remediation techniques; Design and operation of sanitary landfills; Recycling and waste-to-energy technologies;

PRACTICALS: (2 CREDITS) (60 HOURS)

1. Evaluate the condition of sanitary facilities.
2. Ecological foot print of an individual/house/building or institute
3. Calculate water footprint of individuals/households
4. Demonstrate the treatment of water for drinking purposes either by coagulation/disinfection/filtration/ activated charcoal process.
5. Working and design of sewage treatment plants
6. Visit to a waste water treatment plant
7. Analysis of indoor air quality
8. Showcase sustainable agriculture practices using treated wastewater or composted materials

SUGGESTED READINGS:

1. Environmental protection, Sue, Elworthy & Jane, Holder. 1997. Cambridge University Press
2. Environmental and Pollution Laws in India, T. S. Doabia (4th Ed.). 2022. Lexis Nexis Publishers.
3. Environmental Law and Policy in India, Shyam, Diwan & Armin, Rosencranz (3rd Ed.). 2023. Oxford University Press
4. Environmental Law in India, Gurdip Singh (2nd Ed.). 2016. MacMillan Publisher.
5. Handbook of Air Pollution Prevention and Control, Nicholas, P. Cheremisinoff. 2002. Butterworth-Heinemann LTD BH.
6. Handbook of Air Pollution Prevention and Control, Shrinivash Rao. 2016. Scitus Academics LLC.
7. Water Quality Control Handbook, E. R. Alley. 2007. The McGraw-Hill Companies INC.
8. Water Pollution and Management, S. Malik, Sunil Kumar and Umesh Bharti. 2011. Biotech Books.
9. Soil Pollution: Origin, Monitoring and Remediation, Ibrahim Mirsal. 2008. Springer-Verlag Berlin and Heidelberg GmbH and Co.K.
10. Soil Pollution: Processes and Dynamics, Bruno Yarson, Raoul Calvet, Rene Prost. 1996. Springer-Verlag Berlin and Heidelberg GmbH and Co. K.
11. Radioactive Waste Management, James Saling (2nd Ed.). 2001. Routledge.
12. Decommissioning and Radioactive Waste Management, A. Rahman. 2008. Whittles Publishing.