16HS109 ENVIRONMENTAL SCIENCE AND TECHNOLOGY

Hours Per Week :

L	T	P	C
2	-	-	2

Course Description and Objectives:

Environmental science and technology offers technological aspects of environmental science and in maintaining environmental integrity in relation to human development. It helps every engineer to plan appropriate strategies for addressing environmental issues and also contribute to the development of innovative technologies for solving such issues. It produces professionals who will ensure sustainable development of the nation in general and environmental in particular.

Course Outcomes:

Upon completion of the course, the student will be able to

CO1: Observation and integration of diverse information from variable sources outside of the classroom and helps students to think critically, creatively, resourcefully, and strategically, including identifying steps needed to reach goals, manage projects, evaluate progress, and adapt approaches, developing both self reliance, and civic mindedness

CO2: Collaborating across diverse disciplines and practices to identify and create solutions that conserve and help manage biodiversity for the long term

CO3: Analyze the sources of pollutants and their effects on atmosphere and Adapting eco-friendly technologies and maintain hygienic conditions

CO4: Identify the evidence of Global warming, Ozone depletion and acid rain

CO5: Recognize safe receiving storing and handling of raw and prepared food and maintain hygienic conditions.

SKILLS:

- ✓ *Understand structural relationships, abstract models, symbolic languages and deductive reasoning.*
- ✓ *Gain perspectives to adrress the challenges, improvise and devise solutions.*
- ✓ *Identify solutions to environment and development issues, using planning, analysis, modeling, and new approaches.*
- ✓ *Acquire fieldwork techniques to study, observe and prepare documents, charts, PPTs, Models etc.*
- ✓ *Understand how natural resources should be used judiciously, to protect biodiversity and maintain ecosystem.*

UNIT - 1 L-6

NATURAL RESOURCES : Environmental Studies- definition, scope and its importance; Need for public awareness, natural resources, forest resources and deforestation; Water resources - properties and conflicts; Mineral resources - extraction and impacts; Food resources - modern agriculture methods, fertilizer-pesticide problems, water logging and salinity; Energy resources - renewable and non-renewable energy resources, harness technology, solar energy technologies; Land resources - land degradation, soil erosion; Role of an individual in conservation of natural resources.

UNIT - 2 L-6

ECOSYSTEMS AND BIODIVERSITY : Ecosystem - concept, structure and functions of an ecosystem; Food chains, food webs, ecological pyramids, energy flow, energy regulation and succession; Biogeochemical cycles; Aquatic ecosystems; Biodiversity - introduction, bio-geographical classification, values of biodiversity, biodiversity at global, national and local levels, hot-spots of biodiversity, threats to biodiversity, endangered and endemic species of India and conservation of biodiversity.

UNIT - 3 L -6

WASTE MANAGEMENT AND GREEN TECHNOLOGY : Solid waste management - causes, effects and control measures of municipal and industrial wastes; Pollution - air, water, thermal, soil and noise pollutions; Role of an individual in prevention of pollution; Remote sensing / GIS - introduction, definitions, applications of the remote sensing; Innovative practices-objectives, innovative practices in agriculture, forest-community and bio-villages; Green technology for sustainable development, life cycle assessment and its concept.

UNIT - 4 L-6

SOCIAL ISSUES AND EIA : Sustainable development, water conservation, cloud seeding, rainwater harvesting methods, watershed management, global warming, acid rain, ozone layer depletion; Environmental legislation; wildlife protection act, water act, forest conservation act, air act, environmental protection act; Environmental impact asssment (EIA) - introduction, definition of EIA and EIS, scope and objectives, importance of EIA in proposed projects/industry/developmental activity.

UNIT - 5 L-6

ENVIRONMENTAL SANITATION : Food sanitation - food and drugs act, food preservations, milk sanitation, tests for milk, pasteurization of the milk; Water, air, soil and food borne diseases; Maintenance of sanitary and hygienic conditions; Role of youth in the development; Promoting activities -youth as initiators and activities; Field work/environmental visit - visit to a local area to document environmental assets river/ forest/grassland/hill/mountain; Study of local environment - common plants, insects, birds; Study of simple ecosystems - pond, river, hill slopes etc., Visit to industries/water treatment plants/effluent treatment plants.

TEXT BOOKS:

1. A. Kaushik and C.P. Kaushik, “Perspectives in Environmental Studies”, 5th edition, 2016.
2. B. Joseph, “Environmental studies”, 2nd edition, McGraw Hill Education, 2015.

REFERENCE BOOKS:

1. Dr. M. Chandrasekhar, “A Text book of Environmental Studies”, HI-TECH publications, 2006.
2. Dr. M. Anji Reddy, “A Text book of environmental science and Technology”, B S Publications, 2008.
3. Dr. K. Mukkanti, “A Text book of Environmental Studies”, S.Chand and Company Ltd, 2009.
4. EHILRS and ST, “Text book of Municipal and Rural Sanitation”, M.S Hill, 1998.
5. C. S. Rao, “Environmental Pollution Control Engineering”, New Age International Ltd, 2001.
6. Dr. M. Anji Reddy, “Introduction to Remote Sensing”, B S Publications, 2004.
7. K. Joseph and R.Nagendram, “Essentials of environmental studies”, Pearson Education Pt Ltd, Delhi, 2007. Education Pt Ltd, Delhi, 2007.

ACTIVITIES:

- *Painting contests on environmental issues and themes.*
- *Models of energy resources, Pollution and Solid Waste Management- 3R strategy.*
- *Quiz competition.*
- *Essay writing competition.*
- *Skit, JAM and debate.*
- *Field work and documentation.*
- *Assignments.*