SCHEME OF COURSE WORK (R-2020)

Course Details:

Course Title	**: Environmental Science1513ME230**		
Course Code	**: 22BC11Z1**	**L T P C**	**: 2 0 0 0**
Program:	**: B. Tech.**		
Specialization:	**: Mechanical Engineering**		
Semester	**: II**		
Prerequisites	**: Nil**		
Courses to which it is a prerequisite	**: Nil**		

Course Outcomes (COs): At the end of the course the student will be able to

CO-1	To explain the importance of various natural resources.
CO-2	To discuss the interconnectedness of human dependence on the various ecosystems.
CO-3	To apply the knowledge to prevent the major global environmental problems.
CO-4	To explain the water management and environmental acts.
CO-5	To discuss the effect of population growth on the environment.

Program Outcomes (POs): A graduate of mechanical engineering will be able to

PO 1	Apply the knowledge of mathematics, science, engineering fundamentals to solve complex mechanical engineering problems
PO 2	Attain the capability to identify, formulate and analyse problems related to mechanical engineering
PO 3	Design solutions for mechanical system components and processes that meet the specified needs with appropriate consideration for public health and safety
PO 4	Perform analysis, conduct experiments and interpret data by using research methods such as design of experiments to synthesize the information and to provide valid conclusions
PO 5	Select and apply appropriate techniques from the available resources and current mechanical engineering and software tools
PO 6	Carry out their professional practice in mechanical engineering by appropriately considering and weighing the issues related to society
PO 7	Understand the impact of the professional engineering solutions on environmental safety and legal issues
PO 8	Transform into responsible citizens by resorting to professional ethics and norms of the engineering practice
PO 9	Function effectively in individual capacity as well as a member in diverse teams and in multidisciplinary streams
PO 10	Communicate fluently with the engineering community and society, and will be able to prepare reports and make presentations effectively
PO 11	Apply knowledge of the engineering and management principles to managing projects and finance in multidisciplinary environments

PO 12	Engage themselves in independent and life-long learning to continuing professional practice in their specialized areas of mechanical engineering

Course Outcome Vs Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	-	-	-	-	-	-	-	-	-	1	-	2
CO-2	-	-	-	-	-	-	-	-	3	2	-	2
CO-3	-	-	-	-	-	-	-	-	2	3	-	3
CO-4	-	-	-	-	-	-	-	-	-	1	-	-
CO-5	-	-	-	-	-	-	-	-	-	2	-	-

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), Blank: No Correlation

Program Specific Objectives (PSOs): The student must attain the knowledge and skills to

PSO-1	Design, analyse and optimize mechanical systems along with control mechanisms
PSO-2	Manufacture mechanical components by selecting effective processing methods and efficient tools
PSO-3	Design, analyse and evaluate thermal systems

Course Outcome Vs Program Specific Outcomes:

COs	PSO1	PSO2	PSO3
CO-1	-	-	-
CO-2	-	-	-
CO-3	-	-	-
CO-4	-	-	-
CO-5	-	-	-

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), Blank: No Correlation

Teaching-Learning and Evaluation

Week	Contents	Course Outcomes	Sample Questions	Teaching Learning Strategy	Assessment Method & Schedule
1	Renewable and nonrenewable resources, Forest resources: Use and over exploitation.	CO-1	List out major causes and consequences of deforestation.	Lecture Discussion	Seminar
Assessment Methods:	External (100 Marks)				

2	Water resources: Use and over utilization of surface and groundwater – dams – benefits and problems	CO-1	Outline environmental impacts of ground water usage.	Lecture Discussion	Seminar
3	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources	CO-1	Summarize the uses of various types of minerals.	Lecture Discussion	Seminar
4	Concept of an ecosystem - Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids	CO-2	Discuss the models of energy flow in an ecosystem.	Lecture Discussion	Seminar
5	Definition: genetic, species and ecosystem diversity – Value of biodiversity - Biodiversity at global, National and local levels	CO-2	Explain genetic, species and ecosystem diversity.	Lecture Discussion	Seminar
6	India as a megadiversity nation - Hotspots of biodiversity – Threats to biodiversity, Conservation of biodiversity	CO-2	State major threats to biodiversity.	Lecture Discussion	Seminar
7	Definition, cause, effects and control measures of Air Pollution, Water pollution and Noise pollution	CO-3	Describe the sources, effects and control of noise pollution.	Lecture Discussion	Seminar
8	Causes, effects and control measures of wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management.	CO-3	Discuss about solid waste management.	Lecture Discussion	Seminar
10	**MID - I**				
11	Urban problems related to energy – Water conservation, rain water harvesting, watershed management	CO-4	State the objectives and practices of watershed management.	Lecture Discussion	Seminar

12	Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust	CO-4	Write a critical note on nuclear holocaust.	Lecture Discussion	Seminar
13	Environment Protection Act: Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act.	CO-4	Explain about Environment Protection Acts.	Lecture Discussion	Seminar
15	Population growth, variation among nations. Population explosion	CO-5	Define population explosion. Discuss the Indian scenario.	Lecture Discussion	Seminar
16	Family Welfare Programme - Environment and human health - Human Rights – Value Education	CO-5	Explain the objectives and elements of value education.	Lecture Discussion	Seminar
17	HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health	CO-5	Discuss various issues and measures for women and child welfare at international and national level.	Lecture Discussion	Seminar
18	**MID- II**				

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