

GUJARAT TECHNOLOGICAL UNIVERSITY

ENVIRONMENTAL ENGINEERING (17) ENERGY SOURCES & THEIR ENVIRONMENTAL IMPACT SUBJECT CODE: 2741702 M.E. 4TH SEMESTER

Type of course: Applied Science

Prerequisite: Knowledge of environmental impact analysis

Rationale:

To achieve control of Environmental pollution from various sources of energy.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	ESE (V)		PA (I)			
						ESE	OEP	PA	RP	
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	The Energy environment Problem: The nature of problem, contribution factors. Depletion of resources need for conservation, national & intensive issues	04	09
2	Energy sources: The fossil fuels: petroleum fuels, coal, synthetic petroleum products. Geographical energy sources: Hydroelectricity Geothermal Power :Geothermal resources and problems Wind power : Wind power potential and its impact Solar power: solar radiation, its physics solar cell, solar heater solar power transmission tower. Power farm, solar sea power , domestic application of solar energy, and environment impact Nuclear Power: fission, classification of reactor, reactor control reactor safety, nuclear fuel cycles, thermonuclear fusion. Environment Radiation: Radiation units, Radiation effects, radiation standards	14	34
3	Waste Heat Management: Thermal effects on water quality and aquatic life. The dispersion of heat : cooling towers, Minimizing waste heat	08	19
4	Environment degradation : Global Heat Balance Natural energy sources 7 Sinks Mankind's effect	06	14
5	Local Climatic effects a) Primary air pollution: Total suspended particles, oxides of sulfur,	10	24

	oxides of nitrogen, etc. , gaseous air pollutants, indoor air pollution b) Secondary Air Pollution Temperature inversion Photochemical reaction and impact		
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Reference Books:

1. Delbert W Devins, Energy its physical impact on the environment, John Wiley & Sons (1982)
2. Krentz J H, Energy conservation and utilization ,Allign and Bacur Inc. 1976
3. Gramley G M, Energy ,Mac Millian Publishers Co New York

Course Outcome:

After learning the course the students should be able:

1. Understand various sources of energy and their environmental impact
2. How to manage waste heat
3. Effect of global heat balance on environmental degradation.

List of Tutorials:

1. The practical should include study of energy sources and its local climatic effects
2. The tutorial should include calculation of heat balance of a system

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.