

20PEB105 (Audit)					ENERGY AND ENVIRONMENTAL STUDIES					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hours/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	0	2	--	--	--	50	50	PP/NP

#### COURSE OBJECTIVES

- Demonstrate the impact of energy on environment.
- Enhance knowledge of unconventional and renewable energy.
- Develop the skills to address the demand for clean and green energy.
- Stimulate graduates to discover clean, green and safe energy source.

#### Unit – I

Hours- 7

Global environmental studies, biodiversity, Human population and its impact on environment, Energy Resources Classification, Renewable and Non Renewable energy Resources; Tradable and Non tradable; Energy Outlook- Global versus India, Climate and cost of Energy.

#### Unit – II

Hours- 7

Exploration & Production of Fossil Fuels- Crude Oil, Natural Gas, Coal, Shale Gas, Gas Hydrates , CBM and CMM

#### Unit – III

Hours - 6

Renewable and new Energy Resources, Hydro-Energy- Principle of Hydro power; construction of dams, Components of dams and equipment for generating electricity; Solar Energy- Solar Radiation and its measurement; Solar Energy Collectors; Solar Energy Storage Wind Energy-Basic Principles; Power in the wind; Wind Energy Conversion System (WES) the Wind Mills; Electrical Generation System from wind Mills, Energy storage and transmission; Safety System; Environmental aspects, Bio Energy- Energy from Biomass; Methods for obtaining energy; thermal Gasification of biomass; Pyrolysis (Destructive distillation)

#### Unit – IV

Hours - 6

Geothermal Energy- Geothermal Sources; Hydrothermal (Convective) Resources; Geo-pressure Resources; Hot- Dry Rock Resources; Energy from Oceans- Ocean Thermal Electric Conversion (OTEC); Energy from Tides (Tidal energy; Ocean Waves (Energy and Power from the waves; Wave energy conversion devices; Nuclear Energy-Nuclear fusion and Fission, Nuclear Fuels; Process of power generation from Nuclear plants ; Hydrogen Energy- Principle; Hydrogen generation process; Hydrogen Storage and Transportation.

#### COURSE OUTCOMES

On completion of the course, student will be able to

- CO1- Classify energy resources and their impacts on environment
- CO2- Demonstrate the utilization of conventional and non-conventional energy resources
- CO3- Understand the environmental and energy issues
- CO4- Estimate the amount of energy producible from renewable and new energy resources
- CO5- Explain the challenges involved in the production of energy from each resource
- CO6- Evaluate the demand-supply budget in the energy mix

#### TEXT / REFERENCE BOOKS

1. GD Rai, Energy Resources.
2. United Nations Framework Classification for Fossil Energy and Mineral Resources
3. Twindle, J and Weir, A. D. (2006) Energy Resources, 2<sup>nd</sup> Publication, Taylor and Francis Ltd.

#### END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

**PART A:** (Note: the course is AUDIT and grades are Pass/Non Pass based on the (a) attendance, (b) Assignment (c) Viva)

**PART B:**