SEMESTER S5

ENERGY ECONOMICS AND POLICY

Course Code	PEMET526	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	None	Course Type	Theory

Course Objectives:

1. To learn and understand the set of policies that has developed to regulate energy-related behaviour, as well as the economic concepts that direct the actions of energy producers and consumers.
2. To understand different facets of energy supply and demand, with an emphasis on policies that support sustainable energy supply, learn the relationship between energy, the environment, and emission reduction strategies

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SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Energy as a resource and its accounting, Government role in innovation. Introduction, Energy as a system,What is the System of Economic Accounting for Energy, Government's role in mobilising investment and innovation in energy, The importance of the investment environment. Energy Efficiency Characteristics, energy supply and demand analysis. A review of energy efficiency measures (EEM) characteristics, Adoption and measures of EEM, Supply and Demand Analyses, Energy demand science for a decarbonized society. Energy statistics influence on energy consumption for oil rich countries. Global Influence of Oil-Rich Countries, Oil-Rich Countries Statistics, Geo-	9

	Political Influence, Energy Transitions, Energy Policy Shifts.	
2	Behaviour Change Approach to Promote and Sustain Energy Efficiency. Behaviour gaps, Biases, design thinking methodology, Ripple effect. Drivers of human behaviour to meet UN SDGs in relation with Energy. Role of individuals in attaining SDGs, Behavioural aspects in energy modelling, Behaviour changes for sustainable development. Energy efficiency and emission abatement relations. Abatement of emissions through energy efficiency, Sector wise analysis, Harnessing Renewable Energy Potential (Some country case studies).	**9**
3	Energy Market Analysis, Regulations by Government of India. Scenario analyses, feasible options for developing an energy future, the impacts, costs, and financial risks of the various scenarios for transitioning to the energy future, market penetration pathways. The Economics of Depleting Resources & The Oil Sector Examples. Resource depletion and overuse, combating resource depletion and Misuse and pollution, The Prospects for Greener Growth-Policies and Politics of Low-Carbon Growth. Unregulated Markets and Technological Change: oil and natural gas sector examples. The Emergence of Markets, Natural Gas Market, Transportation Market, Markets in Other Segments of the Gas Industry, Trading Models in the Deregulated Natural Gas Industry, Under development and unregulated markets: Reasons why unregulated markets reproduce underdevelopment.	**9**
4	Carbon Emission: Recent Trends and Shift in Policies in India, case studies of different countries. Sector wise emission trends in India, electricity, industry, transportation, buildings, agriculture, policies, case study of other countries. Hydrogen: A Pathway to Carbon Neutral Economy, possibilities and approaches. Hydrogen production and potential utilization, technical challenges, codes and standards development-Public awareness and social	

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	acceptance. Energy efficient policies to achieve SDGs for countries, Importance of Conference of parties (COP). Energy Policy: A Foundation for Transition-Energy Transition: A Paradigm Shift, Future Prospects and Emerging Trends, The Link Between Energy Policy, Energy Transition, and Sustainability in Oil-Rich Countries, Energy Policy Research A Pathway to Achieve UN (SDGs).The Role of COP in Emission Abatement, COP Goals, Agenda, Major Outcomes of COP	**9**

Course Assessment Method
(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

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End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	To enhance the vision while making any energy related decision on supply and demand.	**K2**
CO2	To understand the energy efficiency and behaviour change approaches.	**K3**
CO3	To understand the energy market and energy economics pertaining to oil rich economies	**K3**
CO4	To know the energy policies and emission abatement strategies	**K3**
CO5	To understand UN SDGs and COP	**K3**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

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CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	3	3	3	-	-	-
CO2	3	-	-	-	-	-	3	3	3	-	-	-
CO3	2	-	-	-	-	-	2	3	3	-	-	-
CO4	3	-	-	-	-	-	3	2	3	-	-	-
CO5	2	-	-	-	-	-	3	3	3	-	-	-

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Energy Economics: Concepts, Issues, Markets and Governance. (Selected chapters)	Bhattacharyya, Subhes. C.	Springer. London, UK.	2011
2	Energy Policy: Perspectives, Challenges and Future Directions (Selected chapters)	K J Sreekanth	Nova Publishers USA	2018

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Energy Efficiency Improvements with Emission Abatement for Energy Sustainability	K J Sreekanth	Springer Nature Singapore Pte Ltd.	2024
2	"The Economics of Exhaustible Resources,"	Hotelling, Harold,	Journal of Political Economy,	Vol. 39, No. 2 (April 1931), pp. 137-175
3	An Introduction to Energy Economics. In Stevens, P.(ed.)	Stevens, P.	The Economics of Energy, Vol.1, Edward Elgar, Cheltenham, UK.	2000

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