M.E Semester: 2 Mechanical Engineering (Thermal Engineering)
Subject Name: Economics & Management of Thermal Systems

A. **Course Objective**

- To present a problem oriented in depth knowledge of Economics & Management of Thermal Systems
- To address the underlying concepts and methods behind Economics & Management of Thermal Systems

B. **Teaching / Examination Scheme**

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
METH205-A	Economics & Management of Thermal Systems	3	0	0	3	3	3	70	30	20	0	120

C. **Detailed Syllabus**

1. Role of Power in the Development of a Society with Emphasis on Indian Scene: Both rural and urban as well as agriculture and Industrial development, General economic considerations leading to the choice of a power plant.
2. Fluctuating Loads on Power Plants: Introduction, load curves, Different terms and definitions, Effect of variable load on power plant design and operation, Method to meet variable loads.
3. Peak Load Plants: Requirements, Pump storage power plants, Economical justification of pump storage plant, Their advantages and disadvantages compressed air storage plants, Their advantages and limitation.
4. Economic Analysis of Power Plants: The cost of electrical energy, Selection of the type of generation, Selection of generating equipment, Performance and operating characteristics of power plants, Load division among generators, Tariff methods for electrical energy, Economics of various types of power plants.
5. Combined Operation of Power Plant: Their advantages, Load division between power stations storage type hydro electric plant on combination with steam power plant, Run-off river plant in combination with steam power plant, Coordination hydroelectric and gas turbine plants, Coordination of hydroelectric and nuclear power plants.
6. Role of fuels in power plant economics.

D. **Lesson Planning**

Sr.No.	Date/Week	Unit No.	% Weightage	Topic No:
1	1^{st} ,2^{ed} ,3^{ed}	Unit 1	20 % .	1
2	4^{th} ,5^{th} ,6^{th}	Unit 2	20 %	2
3	7^{th} ,8^{th} ,9^{th}	Unit 3	20 %	3
4	19^{th} ,11^{th} ,12^{th}	Unit 4	20 %	4
5	13^{th} ,14^{th} ,15^{th}	Unit 5	20 %	5,6

E. **Instructional Method & Pedagogy**

1. At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
2. Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all topics while teaching and conduction of all examinations.
3. Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
4. One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.

5. Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
6. Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.

F. **Students Learning Outcomes**

- The student can identify different areas of Economics & Management of Thermal Systems .
- Can find the applications of all the areas in day to day life.

G. **Recommended Study Materials**

- **Text & Reference Books:**

1. Energy management handbook, by Wayne C. Turner, Culinary and Hospitality Industry Publications Services.
2. Handbook of Energy Audits, by Thumann& Younger, Fairmont Press
3. Renewable Energy: Technology, Economics, and Environment by Kaltschmitt, M.
4. Engineering Economics & Costing, by Agasty, SciTech publication (India) pvt.ltd
5. Industrial organization & engineering Economics, by Banga& Sharma, SciTech publication (India) pvt.ltd