Faculty of Engineering and Technology

Bachelor of Technology

Effective from Academic Year: 2020-21

Branch Name:	Mechanical Engineering/ ICT
Semester/Year:	Semester V / Third Year
Subject Title:	Power Plant Engineering (Open Elective)
Subject Code:	1ET1010506
Pre-requisite:	Elements of mechanical engineering

Course Objectives:

1. To provide an overview of thermal power plant.
2. To learn the construction & working principles of different high pressure boilers.
3. To learn the principles of feed water treatment processes in power generation.
4. To learn and understand the economics of power generation process.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory (Marks)		Practical (Marks)		
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total (Marks)
01	00	02	02	35	15	30	20	100

Subject Contents			
Sr. No	Topic	Total Hours	Weightage (%)
1	**Brief Overview of Power Plants:** General layout of modern power plants, Site selection, Presents status of power generation, Steam power plant.	2	16
2	**High Pressure Boilers:** (Unique features and advantages of high pressure boilers, La-Mont; Benson; Velox), supercritical boilers, Supercharged and fluidized bed combustion, Methods of superheat control, Corrosion in boilers and its prevention	04	28
3	**Feed Water Treatment:** Necessity of feed water treatment, Different impurities found in feed water, Effect of impurities, pH & its role in corrosion and scale formation, Internal & external water treatment systems – Hot lime soda process, Zeolite ion exchange process, Demineralization plants, Reverse osmosis process.	04	28
4	**Economics of Power Generation:** Load curves, Load duration curves, Connected load, Maximum load, Peak load, Base load and peak load power plants, Load factor, Plant capacity factor, Plant use factor, Demand factor, Diversity factor, Cost of power plant, Performance and operating characteristics of power plant, Tariff for electric energy	04	28

Course Outcomes:

The student will be able to

1. Understand the different power generation methods, its economics and global energy situation.

2. Understand the construction, working, and significance of various high pressure boilers.
3. Explore the principles of feed water treatment processes in power generation.
4. Understand the economics of power generation process.

List of Reference Books:

1. Nag, P. K. Power plant engineering. Tata McGraw-Hill Education, 2002.
2. Wakil M.M. EI Power Plant Technology , McGraw-Hill Education.
3. Rajput.R.K. Thermal Engineering , , Laxmi Publication .
4. Ballany P.L. Thermal Engineering, Khanna Publishers.
5. Arora S.C. Power Plant Engineering, Dhanpat Rai Publishers.
6. Raja A.K. Power Plant Engineering, New Age Publishers.
7. Nagpal G.R., Power Plant Engineering, Khanna Publishers.

List of Tutorials:

1. High pressure boilers performance..
2. Economics of power generation.

E-Resources:

1. http://nptel.ac.in/
2. http://npti.in/default.aspx