

COURSE CODE: <b>1152EE107</b>	COURSE TITLE: <b>POWER PLANT ENGINEERING</b>	L	T	P	C
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**COURSE CATEGORY:**

Program Elective

**PREAMBLE :**

To understand the different methods of power generation and its construction working principle of power plants

**PREREQUISITE COURSES:**

- Basic Electrical Engineering

**COURSE EDUCATIONAL OBJECTIVES :**

The objectives of the course are to make the students,

- To understand the thermal and hydro power plant full performance
- To explain the function of nuclear power stations
- To understand gas, diesel power plants and non-conventional plants

**COURSE OUTCOMES :**

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
C01	Understand about thermal power plants	K2
C02	Explain about hydro power plant	K2
C03	Understand working of nuclear power plants	K2
C04	Explain about gas power plain working	K2
C05	Understand about non-conventional power plant	K2

**CORRELATION OF COs AND POs**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H				L	L				L	M	
CO2	L					L	H			L	M	
CO3	M									L		
CO4	M		M		H		L				L	
CO5	H		M		H	M					L	

**COURSE CONTENT:**

UNIT I	THERMAL POWER PLANTS	9
Energy resources and their availability - Types of power plants, selection of the plants - Basic thermodynamic cycles - Various component of steam power plant layout - Pulverized coal burners - fluidized bed combustion - Coal handling systems - Ash handling systems - Forced draft and induced draft fans – Boilers Feed pumps - Super heater - Turbines - Regenerator - Condenser - Dearearators – Cooling towers		
UNIT II	HYDRO ELECTIC POWER PLANTS	9

Layout - Dams - Selection of water turbines - Types - Pumped storage hydel plants		
<b>UNIT III</b>	<b>NUCLEAR POWER PLANTS</b>	<b>9</b>
Principles of nuclear energy - Basic nuclear reactions - Nuclear power station - Troubleshooting and remedies - Nuclear Waste disposal		
<b>UNIT IV</b>	<b>GAS AND DIESEL POWER PLANTS</b>	<b>9</b>
Types - Open and closed cycle gas turbine - Work output and thermal efficiency - Methods to improve thermal efficiency of gas turbine plant - Reheating - Intercooling - Regeneration and their combinations - Advantages and disadvantages - Comparison with steam power plants problems. Diesel engine power plant – component and layout		
<b>UNIT V</b>	<b>NON-CONVENTIONAL POWER GENERATION</b>	<b>9</b>
Solar radiation estimation, solar energy collectors, OTEC, wind power plants, tidal power plants and geothermal resources, fuel cell, MHD power generation -principle, thermoelectric power generation, thermionic power generation.		
<b>TOTAL: 45 PERIODS</b>		
<b>TEXT BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Power station Engineering and Economy by Bernhardt G.A.Skrotzki and William A. Vopat - Tata Mc Graw Hill Publishing Company Ltd., New Delhi, 20th reprint 2002.</li> <li>2. Power Plant Engineering: P.K Nag, Tata McGraw Hill Second Edition 2001.</li> </ol>		
<b>REFERENCE BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. An Introduction to power plant technology by G.D. Rai-Khanna Publishers, Delhi - 110 005.</li> <li>2. A Course in Power Plant Engineering by Arora and Domkundwar Dhanpat Rai and Co. Pvt. Ltd., New Delhi.</li> <li>3. Power Plant Engineering.:M.M. El-Wakil McGraw Hill 1985.</li> </ol>		