INSTITUTE	**DIPLOMA STUDIES**
PROGRAM	**DIPLOMA ENGINEERING (MECHANICAL ENGINEERING)**
SEMESTER	**6**
COURSE TITLE	**POWER PLANT ENGINEERING**
COURSE CODE	**09ME1606**
COURSE CREDITS	**4**

Objective:

1 Requirement of power in Indian industry is very huge. In India even today power generation is less compare to power consumption. Every sector of Indian economy required power and energy, economy growth of any sector is also depends on growth of this sector. Fuel supply and distribution is also an area where country is still developing smooth lines of supply. Many private as well as public sector are looking for business opportunity in this area. Growth in business create more job opportunity to the students in this field. Hence, this course attempts to provide them basic knowledge of the technologies available at plant level and would also acquaint them with the latest technological advances taking place in this sector.

Course Outcomes: After completion of this course, student will be able to:

1 Identify elements and their functions of different power sources or power plants.
2 Operate equipment of different power plants
3 Analyze economics and factor affecting the power plants.
4 Identify performance parameters of power plants.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**INTRODUCTION TO POWER PLANTS** Need of energy in India, Introduction to Power plants – concept, types, conversion of energy, National Grids, Hydro power plant, Diesel power plant,, Nuclear power plant, Classification and fundamentals of all power plants,, Detail about power plant in Gujarat.	8

MR. NAVNITKUMAR JAGJIVANBHAI PATEL
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DR. RAJESHKUMAR MEGHAJIBHAI PATEL
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Contents : Unit	Topics	Contact Hours
2	**STEAM POWER PLANTS** Working of Rankine cycle, reheats cycle regenerative cycle, reheat regenerative cycle. P-v and T-s diagram of all cycle, working of high pressure boiler, Fluidized based combustion boiler, principle, types, need; Need of water treatment plant for boilers,, Super heaters and air pre heaters, coal handling system, pulverized fuel system,, Electro-Static Precipitators (ESP), performance parameter,, control system, monitoring system, Need of record keeping.	17
3	**GAS TURBINE POWER PLANT** Introduction, Brayton cycle concept, open cycle gas turbine,, closed cycle gas turbine, Essential accessory and other equipment,, performance parameter of gas turbine power plant, Advantages over other	7
4	**SOLAR AND WIND POWER PLANTS** Wind power plant- Introduction, advantages, disadvantages;, potential of wind energy in India, Solar power plan Introduction, types of solar panel, conversion of solar energy, satellite solar power system, concept of zero energy house, potential of solar energy in India.	5
5	**ECONOMIC ANALYSIS OF POWER PLANTS** Electrical energy cost, Selection of type of generation, Performance and load deviation of power plants, Calculate performance of power plants based on load variations	5
Total Hours		**42**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**To make survey about need of energy in India.** To make survey about need of energy in India.	2
2	**To study about steam based power plant.** To study about steam based power plant.	6
3	**To study about gas turbine power plant.** To study about gas turbine power plant.	4
4	**To study about solar power plant** To study about solar power plant	4
5	**To study about wind power plant.** To study about wind power plant.	4
6	**To study about nuclear power plant.** To study about nuclear power plant.	4
7	**To study about economic analysis of power plants.** To study about economic analysis of power plants.	4
Total Hours		**28**

MR. NAVNITKUMAR JAGJIVANBHAI PATEL
Digitally signed by (Name of HOD)

DR. RAJESHKUMAR MEGHAJIBHAI PATEL
Digitally signed by (Name of Dean/ Principal)

Textbook :

1 Power Plant Engineering, R. B. Varia, Atul Prakashan, 2018

References:

1 Power Plant Engineering, Power Plant Engineering, Dr. P C Sharma, S. K. Kataria Publication, 2013

2 Power Plant Engineering, Power Plant Engineering, P K Nag, Tata Mc Graw Hill Publication, 2002

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking**
26.00	37.00	37.00			

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory

3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Supplementary Resources:

1 https://onlinecourses.nptel.ac.in/noc21_me86/preview

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Digitally signed by (Name of HOD)

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