

COURSE TYPE	COURSE CODE	NAME OF THE COURSE	L	T	P	CREDIT
DE	NFMD501	Powerplant Engineering	3	0	0	3

COURSE OBJECTIVE
The course aims to give information about the operations of different types of power plants.
LEARNING OUTCOMES
At the end of the course, students will get detailed knowledge about the working of thermal power plants and a broad idea about the working of power plants with alternate energy resources.

NO.	TOPICS TO BE COVERED	HOURS	LEARNING OUTCOME
1	Energy scenario in India, Introduction to the types of power plants. Basics of Thermodynamics, Fluid Mechanics and Heat Transfer.	4	Outline of the energy scenario in India and the power generation methods. Revision of the prerequisites.
2	Steam vapor power cycle, Effect of operating conditions on the steam cycle efficiency, Methods to improve the steam cycle performance.	4	Thermodynamic details of the steam power cycle.
3	Coal-fired steam generators and their types. Mountings & accessories in coal-fired steam generators. Steam Condensers.	9	Types of coal-fired steam generators. Details about the working of various components in coal-fired power plants.
4	Coal properties, Coal handling, Combustion of solid fuel, Ash handling, Feed water treatment.	8	Details about coal & ash handling and coal properties. Knowledge of the prominent analysis for coal. Chemistry of feed water treatment.
5	Steam nozzles & turbines, Energy losses in steam turbines. Gas power cycle, Rotary and axial air compressors, Gas turbines.	8	Details of the steam turbines & gas-fired power cycle and the associated turbomachinery.
6	Hydropower plants & Hydro turbines. Nuclear power plants, solar thermal power plants, solar photovoltaic power, and wind energy.	7	Fundamental knowledge of the power plants with alternate energy resources.
7	Economy of power generation, Environmental aspect of power generation.	2	Knowledge about the economy and the environmental impact of power plants.
Total		42	

TEXT BOOKS:

1. Power plant Engineering by P K Nag, TataMcGraw Hill

REFERENCE BOOKS:

1. Gas Turbine Theory by H.H. Saravnamutoo, H. Cohen, GFC Rogers, Pearson
2. Fluid mechanics by F.M. White and H. Xue, McGraw Hill
3. Thermodynamics an Engineering approach by Y.A. Cengel and M.A. Boles, McGraw Hill
4. Fundamentals of Heat and Mass Transfer by T.L. Bergman, A.S. Lavine, F.P. Incropera and D.P. Dewitt, John Wiley and Sons