	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM

Programme	**Bachelor of Technology in Electrical and Electronics Engineering**	Year of Regulation	**2017-18**
Department	**Electrical Engineering**	Semester	**VI**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
EE216	**Power Plant Engineering**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives	Course Outcomes		
To understand different types of power plant		CO1	**Able to acquire knowledge about different types of power plant**
To understand different types of power plant functions		CO2	**Able to acquire knowledge about power plant functions**
To understand different types of power plant flow lines and related issues.		CO3	**Able to compute and analyze power plant flow lines and their related issues**
To analyse, solve energy and economic related issues in power sectors.		CO4	**Able to compute and analyze energy, economic issues**
		CO5	
		CO6	

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	**3**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**3**
2	CO2	**3**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**2**
3	CO3	**2**	**3**	**3**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**2**
4	CO4	**2**	**2**	**3**	**0**	**2**	**2**	**3**	**0**	**2**	**0**	**0**	**1**	**2**	**3**	**2**
5	CO5	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
6	CO6	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SYLLABUS

No.	Content	Hours	COs
I	**Power Plants – Coal:** **Rankine cycle – improvisations, Layout of modern coal power plant, Super Critical Boilers, FBC Boilers, Turbines, Condensers, Steam & Heat rate, Subsystems of thermal power plants – Fuel and ash handling, Draught system, Feed water treatment, Binary Cycles and Cogeneration systems.**	**09**	**CO1** **CO2** **CO3**
II	**Power Plants – Diesel, Gas and Combined Cycle:** **Otto, Diesel, Dual & Brayton Cycle – Analysis & Optimisation, Components of Diesel and Gas Turbine power plants, Combined Cycle Plants, Integrated Gasifier based Combined Cycle systems.**	**07**	**CO1** **CO2** **CO3**
III	**Power Plants – Nuclear:** **Basics of Nuclear Engineering, Layout and subsystems of Nuclear Power Plants, Working of Nuclear Reactors: Boiling Water Reactor (BWR), Pressurized Water Reactor (PWR), CANada Deuterium- Uranium reactor (CANDU), Breeder, Gas Cooled and Liquid Metal Cooled Reactors, Safety measures for Nuclear Power plants.**	**08**	**CO1** **CO2** **CO3**
IV	**Power Plants – Renewable Sources :** **Hydro Electric Power Plants – Classification, Typical Layout and associated components including Turbines, Principle, Construction and working of Wind, Tidal, Solar Photo Voltaic (SPV), Solar Thermal, Geo Thermal, Biogas and Fuel Cell power systems.**	**07**	**CO1** **CO2** **CO3**
V	**Economic and Environmental Issues:** **Power tariff types, Load distribution parameters, Load curve, Comparison of site selection criteria, relative merits & demerits, Capital & Operating Cost of different power plants, Pollution control technologies including Waste Disposal Options for Coal and Nuclear Power Plants.**	**05**	**CO4**
Total Hours		**36**	

Essential Readings

1. P. K. Nag, “Power Plant Engineering”, Tata McGraw – Hill Ltd., Third Edition, 2008.
2. Black and Veatch, “Power Plant Engineering”, Springer, 1996.

Supplementary Readings

1. M. M. El-Wakil, “Power Plant Technology”, Tata McGraw – Hill Ltd., 2010.
2. Thomas C. Elliott, Kao Chen and Robert C. Swanekamp, “Standard Handbook of Power Plant Engineering”, McGraw – Hill, Second Edition, 1998.
3. Godfrey Boyle, “Renewable Energy”, Open University and Oxford University Press, 2004.