	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM

Programme	**Bachelor of Technology in Mechanical Engineering**	Year of Regulation	**2018**
Department	**Mechanical Engineering**	Semester	**VI**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
ME-312	**Power Plant Engineering**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives	To teach the steam turbines and its performance and applications	Course Outcomes	CO1	Understand the basic working principle of steam power plant, methods to increase the performance of Rankine cycle, circulation, riser, down comer, economizer, superheater, air preheater and evaporator, steam turbines, nozzles and blades andsolve related problems. (Applying)
	To teach the hydroelectric turbines and its performance and applications		CO2	Understand the hydro turbines, its performance parameters along with the velocity triangle, cavitation, governing andsolve related problems (Applying).
	To teach the diesel and nuclear power plant and its performance and applications		CO3	Explain the functioning of diesel power plant, types, layout and various components, details of combustion, turbocharging and supercharging and solverelated problems (Applying).
	To introduce present energy scenario, source and energy storage along with the economics and emissions of power plant.		CO4	Explain the functioning of nuclear power plant and solve related problem (Applying)
			CO5	Explain the economics of power plant based on load variation, solve related problems and describe the power plant emissions(Applying)

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**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**0**
2	CO2	**3**	**3**	**2**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**0**
3	CO3	**3**	**2**	**2**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**0**
4	CO4	**3**	**2**	**2**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**3**	**2**	**0**
5	CO5	**3**	**3**	**2**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**3**	**3**	**0**

SYLLABUS

No.	Content	Hours	COs
I	**Steam Turbine Power Plants** Rankine cycle, reheating of steam, feedwater heaters, boiler and types, circulation, riser, down comer, economizer, superheater, air preheater and evaporator, steam turbines, nozzles and blades.	**10**	**CO1**
II	**Hydro Electric Power Plants** Turbines and other equipment, classification of plants and turbines, velocity triangle, cavitation, governing, performance.	**08**	**CO2**
III	**Diesel Power Plants** Types, application, advantages and layout of diesel plants, components, combustion, performance, turbocharging and supercharging.	**06**	**CO3**
IV	**Nuclear Power Plants:** Atomic structure, nuclear fission and nuclear fusion, nuclear fuel cycle, radioactive decay, nuclear reactors.	**06**	**CO4**
V	**Power Plant Economics & Environmental Aspect:** Energy scenario, sources of energy, energy storage, economics of power plant, plant investment costs, fixed charges, Operation cost, energy cost, depreciation, incremental cost, greenhouse effect, thermal pollution, other pollutants.	**06**	**CO5**
	Total Hours	**36**	

Essential Readings

1. P.K. Nag,“Power Plant Engineering”, Tata McGraw Hill.
2. R.K. Hegde, “Power Plant Engineering”, Pearson Education India.

Supplementary Readings

1. AW Culp. Principles of Energy Conversion, Tata McGraw Hill.
2. Y.A. Çengel and M.A. Boles,“Thermodynamics - An Engineering Approach”, McGraw Hill.
3. B.G.A. Skrotzki and W.A. Vopat, “Power Station Engineering and Economy”, Tata McGraw Hill.