

**POWER PLANT MAINTENANCE INDUCTION COURSE CONTENT - MECHANICAL  
STREAM**

S.NO	TOPIC DESCRIPTION	LECTURE (DAYS)	PRACTICAL / TUTORIAL (DAYS)
1	Electricity Generation & Power Sector Scenario	1	NIL
	Law of conservation of energy, energy conversion in power plants, types of conventional power plants, non-renewable energy resources, Power sector scenario in India, Power sector scenario worldwide, opportunities in power sector		Test
2	Power Plant Cycles & Major Equipments	2	NIL
	Carnot cycle, Petrol / Diesel cycle, Brayton cycle, steam - water properties, Rankine cycle, modified Rankine cycle, combined cycle		Test
3	Power Plant Terminologies	1	NIL
	Energy, Enthalpy, Entropy, Supply, Demand, Base load, Peak load, Grid, load dispatch center, plant load factor, Heat rate, efficiency, Aux. power consumption, Capacity, Availability, Reliability, Mean life time to failure, Blackout, Synchronize, Islanding, Backing down, Planned outage, Forced outage, Breakdown, Unit of electricity, Watt, Mega watt, Million units, Sub critical, Super critical, Ultra super critical, Super thermal PP, Ultra mega PP, Work order card, Permit to work		Test
4	Power Plant Systems - Main Cycles & Components	4	NIL
	Feed water circuit, Steam circuit, Turbine bypass circuit, Condensate circuit, Combustion air circuit, Flue gas circuit, Turbine extraction system, Auxiliary steam system, Turbine gland sealing system, Chemical dosing system, Generator seal oil system, Generator stator cooling system, Generator rotor cooling system, equipment cooling system, Condenser air extraction system		Test
5	Power Plant Systems - Auxiliaries	2	NIL
	Condenser cooling water system, Fuel handling system, Ash handling system, Compressed air system, Demineralization system,		Test
6	Introduction to Power Plant Maintenance	1	NIL
	Types of maintenance: Preventive, Predictive, Corrective maintenance, Outages - Planned, Forced, Maintenance departments - planning, running maintenance, overhaul maintenance, quality & NDT division, condition monitoring cell. Maintenance facilities: workshop, maintenance bay, maintenance stores. Maintenance equipments & tools		Test
7	Precision Measurements	3	4
	Use of outside micrometers, use of inside micrometers, use of vernier and height gauges, use of feeler and slip gauges, use of telescope gauges and small hole gauges, use of dial indicators		Practical Task / Test
8	Rigging and Scaffolding	2	NIL

	Safety in Rigging & Scaffolding, planning a rigging job, tools & equipments used in rigging, performing a rigging job, Rigging signals, parts of scaffolding, making a scaffolding		Test
9	Metallurgy	2	NIL
	Metallurgy and processing metals, properties of metals, stresses and testing of metals, classification of metals, heat treatment of metals		Test
10	Pipes and pipe fittings	2	NIL
	Pipes and tubes, classification of pipes, pipe material and application, maintenance in pipes, high pressure pipes, different pipe fittings		Test
11	Bearings and Lubrication	3	4
	Types of bearings, maintenance of plain bearings, maintenance of anti friction bearings, lubrication of bearings		Practical Task / Test
12	Gaskets, Packings and Mechanical seals	3	4
	Types of gaskets, maintenance using gaskets, maintenance using gland packings, Types of mechanical seals, maintenance of mechanical seals		Practical Task / Test
13	Power Transmission Components	3	NIL
	Types of couplings and its maintenance, Types of gears and maintenance of gear drives, maintenance of belt drives, maintenance of chain drives		Test
14	Valves	3	6
	Types of valves, maintenance of gate valves, maintenance of globe valves, maintenance of ball valves, maintenance of butterfly valves, maintenances of plug valves, maintenance of swing check valves, maintenance of needle valves, maintenance of diaphragm valves		Practical Task / Test
15	Pressure Relief Valves	2	4
	Types of pressure relief valves, maintenance of safety valves, maintenance of safety relief valves, maintenance of relief valves, setting of safety / relief valves		Practical Task / Test
16	Heat Exchangers	3	NIL
	Intruduction to heat exchangers, Types of heat exchangers, Fin-fan cooler, Shell and tube heat exchangers, maintenance and repair of heat exchangers		Test
17	Pumps	3	8
	Centrifugal pumps - principle of operation, parts, maintenance & trouble shooting; Vertical pumps - parts and maintenance, Positive displacement pumps - types, parts, principle of operation, maintenance & trouble shooting		Practical Task / Test
18	Air Compressors	3	NIL
	Principle of operation, types of air compressors, Air compressor auxiliaries, maintenance and trouble shoot of air compressors		Test
19	Diesel Engine	3	NIL

	Engine components, Diesel engine support systems, Maintenance of diesel engines		Test
20	Fans and Blowers	2	NIL
	Introduction to fans, Types of fans, fans & blowers maintenance and trouble shooting		Test
21	Hydraulic Systems Maintenance	2	NIL
	Introduction to hydraulic system, components of hydraulic system, maintenance & trouble shooting of hydraulic systems		Test
22	Boiler / HRSG	3	NIL
	Types of boiler, parts of boiler, fuels & combustion, maintenance of boiler components		Test
23	Gas Turbine	3	NIL
	Introduction to Gas Turbines, Gas Turbine components, Running maintenance, Overhauls - Combustion Inspection, Hot Gas Path Inspection, Major Inspection		Test
24	Steam Turbine	4	NIL
	Introduction to Steam Turbines, Steam Turbine components, Running maintenance, Overhauls checks & procedures, Governing system		Test
25	Alignment Methods	3	12
	Introduction to Alignment, Alignment methods - Rim & face alignment, Reverse indicator alignment, Laser alignment		Practical Task / Test
26	Vibration and Balancing	3	NIL
	Introduction to Vibration analysis, identifying faults using vibration analysis, vibration measuring instruments. Introduction to balancing, single plane & multi plane balancing		Test
27	Non Destructive Testing	2	NIL
	Introduction to NDT, Types of NDT - Dye penetrant test, Magnetic particle inspection, X-ray, Ultrasonic testing		Test
28	Power Plant Equipment Erection & Commissioning	4	NIL
	Equipment erection sequence, erection tools & plants, erection techniques, important system commissioning procedures		Test
29	De-Salination Plant	4	Nil
	Introduction to de-salination, systems & components in de-salination plant, types of de-salination techniques, operation of de-salination plant, maintenance of de-salination plant		Test
30	Power Plant Safety	2	NIL
	Importance of safety in power plant, Fire fighting techniques, 5S, housekeeping, Hazards in power plant and its safety		Test
	TOTAL DAYS	78	42
	TOTAL WEEKS (6 Days / Week)	13	7