



SECOND-YEAR DIPLOMA ENGINEERING SYLLABUS

Semester: 3rd

Course Code: 002203307

Type of Course: PCC-6

Course Name: ELECTRICAL POWER STATION ENGINEERING

Course Prerequisites: Basic knowledge of Power Plant

COURSE OBJECTIVE(S):

The practical exercises, the underpinning knowledge and the relevant soft skills associated with the identified competency are to be developed in the student for the achievement of the following COs:

- a) Supervise functioning of Thermal power plant.
- b) Supervise functioning of Hydro power plant.
- c) Supervise functioning of Nuclear power plant.
- d) Supervise functioning of solar plant.
- e) Supervise functioning of wind power plant.

TEACHING & EXAMINATION SCHEME:

Teaching Scheme (Hrs/Week)				Examination Scheme				
Theory	Tutorial	Practical	Credit	SEE		CA		
				Th	Pr	MSE	PLE	LA
3	0	2	4	60	0	20	20	0
							Total	
							100	

SEE: Semester End Examination; CA: Continuous Assessment; Th: Theory; Pr: Practical; MSE: Mid Semester Examination; PLE: Participatory Learning Experience; LA: Laboratory Assessment

TOTAL Theory Hours: No. of Th. and Tut.Hrs/Week*15 = 45

COURSE CONTENT(S):

Unit No.	Content	Hours	Weightage (%)
1	Thermal Power Station 1.1 Energy conversion process for thermal power station with plant layout. 1.2 Selection criteria for site of thermal power station 1.3 Line diagram of thermal power station (TPS); Different cycles of TPS 1.4 Major equipment and auxiliaries of TPS (including Boiler, steam turbine, Turbo Generator, super heater, economizer and electro static precipitator. 1.5 Base load and peak load power plants. 1.6 Safe Practices of TPS 1.7 Pollution generated by thermal power stations and methods to reduce them.	10	25%



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	1.8 Major TPS in Gujarat		
2	Hydro Power Station 2.1 Energy conversion process for hydro- power station (HPS) with plant layout. 2.2 Selection of site for HPS site 2.3 Major features of HPS 2.4 Classification of HPS: based on head, Storage and pondage, Plant Layout, types of hydro turbines; Auxiliaries 2.5 Safe Practices of HPS 2.6 Difference between Generators for Thermal Plant and Hydro Plants. 2.7 Advantages of Hydro Power Plants and their effect on ecology/environment 2.8 Hydro power stations in Gujarat	10	25%
3	Nuclear Power Station 3.1 Energy conversion process for NPS: Nuclear fusion and fission, Chain reaction 3.2 Selection of site for NPS 3.3 Working of nuclear power station 3.4 Various types of reactors 3.5 Special precautions for NPS 3.6 Advantages and disadvantage of NPS 3.7 Nuclear power stations in Gujarat	11	25%
4	Solar Power Plant 4.1 Solar constants, Measurement of solar radiations 4.2 Large (more than 1 MW) Solar photovoltaic (PV) and concentrated solar power (CSP) solar plants in Gujarat. 4.3 Solar Energy Conversion of CSP 4.4 CSP generators, construction and working principle 4.5 construction of a solar PV systems: Solar cell, Module, Panel and array 4.6 Types of solar PV system: Stand – Alone,, Grid Tied, Hybrid system 4.7 Safety precautions of Solar PV systems	10	20%
5	Wind Power Plant & Captive power plant 5.1 Anemometer, wind vane, site selection, Power of the wind, power curve of wind turbines.	02	10%



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	5.2 HAWT and VAWT		
	5.3 Stall control, pitch control and active tall control of WPPs.		
	5.4 Geared wind power plants (WPPs), direct drive WPPs and Hybrid (semi- geared) WPPs		
	5.5 Safety precautions to be during the routine maintenance of large and small wind turbines		
	5.6 Large wind farms in Gujarat		
	5.7 Electrical energy conversion of DG sets, advantages and limitations		
	5.8 Electrical energy conversion of gas- based power plants, advantages, and limitations.		
	TOTAL	45	100%

Text Book(s):

Title of the Book	Author(s)	Publication
Electrical Power Generation and Transmission	D.R.Mehta	Mehta Prakashan
Electrical Power Generation and Transmission	Rp Ajwaliya	Atul Prakashan

Reference Book(s):

Title of the Book	Author(s)	Publication
Electrical Power system	Mehta, V.K.	S. Chand & Co., New Delhi, 2011
Wind Power Technology	Earnest, Joshua	PHI Learning, New Delhi, 2013
Electrical Power	Uppal, S.L.	Khanna publication, New Delhi, 2011
Power plant Engineering	Nag, P K	Tata McGraw Hill, New Delhi, 2011
Solar PV Lab Manual	Solanki, Chetan S.	PHI Learning, New Delhi, 2013

Web Material Link(s):

- <https://www.electrical4u.com/electrical-engineering-articles/basic-electrical/>
- <https://www.electricaltechnology.org/>



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COURSE EVALUATION:

Sr. No.	Activity	Marks	Weightage
1	Semester End Examination (External Th)	60	60%
2	Internal Examination	40	40%
2(a)	Mid Semester Examination	20	
2(b)	Attendance	10	
2(c)	Assessment Types (Any One from 2(c).1 to 2(c).7)	10	
2(c).1	Subject (Course) based Mini-Project		
2(c).2	Industry/Site Visit & Report		
2(c).3	Assignment		
2(c).4	Seminar		
2(c).5	Case Study		
2(c).6	Surprise Class Quiz		
2(c).7	Design Exercise		
2(c).7	Presentation		
2(d)	Practical (if Applicable)		

* For 4 Credit Subjects

1 Credit = 25 Marks

Theory: 3 Credits = 75 Marks

Practicals: 1 Credit = 25 Marks

SEE Evaluation will be of 100 marks and converted to 50 Marks (75 Th + 25 Pr)

CA Evaluation will be of 100 Marks and converted to 50 Marks. (75 Th + 25 Pr)

Distribution of Marks for Theory Evaluation as per Bloom's Taxonomy Level:

Level	Remember	Understand	Apply	Analyze	Evaluate	Create
% Weightage	20%	20%	15%	15%	15%	15%

COURSE OUTCOMES :

CO1	General idea & working of site selection & energy conservation processes for TPS.
CO2	General idea & working of site selection & energy conservation processes for HPS.
CO3	General idea & working of site selection & energy conservation processes for NPS.
CO4	Concepts of Solar power plant working, types and principle. Photovoltaic systems.
CO5	Understand the conventional and renewable energy sources of power generation.