Faculty of Engineering and Technology
Diploma Engineering Semester III
(Electrical Engineering)
In Effect from Academic Year 2021-22

Subject Code: 1ET4030303	Subject Title: Electrical Power Generation
Pre-Requisite	--

RATIONALE:

Generation of Electric Power is most important activity in power system. With growing demand for electric power at one hand and depleting fossil fuel resources it has become more necessary to generate electric power more efficiently and with the help of renewal energy resources. With advancement in technology it has become possible to generate electric power commercially using wind and solar energy. This course therefore deals in detail about generation of electric power using Thermal (Coal), Hydro, Nuclear, Diesel, Solar, Wind energy sources. This course attempts to develop the basic cognitive skills required to take appropriate decisions to maintain the various generating and auxiliary equipment of power plants.

COURSE OBJECTIVE:

The course content should be taught and implemented with the aim to develop different types of skills so that students are able to acquire following competency.

1. Supervise the functioning of different types of electric power generating plants for safe operation.

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment
4	-	2	5	60	40	20	30

DETAILS OF COURSE CONTENTS:

Sr No	Topics and Sub-topics	Total Hours	% Weightage
1	**THERMAL POWER STATION** 1.1 Explain thermal energy conversion process with block diagrams 1.2 Identify the appropriate site of a TPS 1.3 Describe the working of thermal power station (TPS) Using single line diagram 1.3 State the functions of the major equipment and auxiliaries of a TPS	12	25

	1.4 Distinguish between load curve and load duration curve 1.5 Differentiate between base load and peak load power plants 1.6 Name the major TPS in Gujarat		
2	**HYDRO POWER STATION** 2.1 Explain hydro energy conversion process with block diagrams 2.2 Identify the appropriate site 2.3 Classify the different types of HPS 2.4 Differentiate between different types of Hydro Turbines. 2.5 Name the major HPS in Gujarat	**12**	**20**
3	**NUCLEAR POWER STATION** 3.1 Explain energy conversion process with block diagrams 3.2 Identify the appropriate site for a NPS. 3.3 Explain the working of Nuclear power station 3.4 Describe various types of reactors 3.5 State special precautions required for NPS 3.6 Name the major TPS in Gujarat	**12**	**20**
4	**DIESEL POWER STATION** 4.1 Schematic arrangement of diesel power station 4.2 Different systems of diesel power station 4.3 Application of diesel power station 4.4 Advantages and Disadvantages of diesel power station 4.5 Cooling of Alternators	**08**	**15**
5	**INTRODUCTION OF SOLAR POWER PLANT AND WIND POWER PLANT** 5.1 Introduction of solar energy 5.2 Advantage and Disadvantage of solar energy 5.3 Utilisation of solar energy 5.4 Name the large solar power plants in Gujarat 5.6 Introduction of wind energy 5.7 Energy conversion in wind power plant 5.8 Selection of site for wind power plant 5.9 Name the large solar power plants in Gujarat	**12**	**20**

COURSE OUTCOME:

The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes:

1. Understand the of concept of AC system.
2. Understand behavior of basic parameters when they connected in series as well as parallel.
3. Understand the three phase connection.
4. Understand importance of power factor.

LIST OF PRACTICAL:

1	Interpret the line diagram of Thermal Power Station (T.P.S.) and main cycles & explain working of T. P. S.
2	Prepare technical report of visit to a nearby T.P.S./ Prepare a report on thermal power stations in Gujarat by collecting data from Internet
3	Energy conversion process for hydro- power station (HPS) with plant layout and elements of hydro power station
4	Prepare technical report of visit to a nearby H.P.S./ Prepare a report on Hydro power stations in Gujarat by collecting data from Internet
5	Interpret the schematic diagram of Nuclear power station & explain the function of each component.
6	Draw and Interpret schematic diagram of a Diesel Power Station
7	Prepare technical report of visit to a nearby Solar PV station.
8	Prepare technical report of visit to a nearby Wind farm.
9	Visit the website of NTPC and prepare a report
10	Visit the website of NHPC and prepare a report
11	Visit the website of MNRE/GEDA and prepare a report

LIST OF REFERENCES:

SR. No.	Title of Books	Author	Publication
1	Electrical Power system	Mehta, V.K.	S. Chand & Co., New Delhi, 2011
2	Generation of Electrical Energy	B. R. Gupta	S Chand & Co Ltd
3	Electrical Power Generation	R P Ajwalia	Atul publication
4	Electrical Power	Uppal, S.L.	Khanna publication, New Delhi, 2011
5	Renewable Energy Technologies	Solanki, Chetan S.	PHI Learning, New Delhi, 2011

LIST OF LEARNING WEBSITES

1. https://www.google.com
2. https://www.youtube.com