



Orissa School of Mining Engineering Keonjhar

Department of Electrical Engineering

Lesson plan (utilization of electrical energy and traction)

VISION OF OUR DEPARTMENT:

To provide excellent knowledge and enrich the problem solving skills of the students in the field of Electrical Engineering with a focus to prepare the students for industry need, recognized as innovative leader, responsible citizen and improve the environment.

MISSION OF OUR DEPARTMENT:

1. Prepare the students with strong fundamental concepts, analytical capability, and problem solving skills. Create an ambience of education through faculty training, self-learning, sound academic practices and research endeavors.
2. Provide opportunities to promote organizational and leadership skills in students through various extra- curricular and co-curricular events.
3. To make the students as far as possible industry ready to enhance their employability in the industries.
4. To improve department industry collaboration and to maintain effective operational environment.

Program Educational Objectives

The Program Educational Objectives (PEOs) of the Electrical Engineering Department are given below:

1. PEO1- To engage in Design of Systems, tools and applications in the field of electrical Engineering and allied engineering Industries.
2. PEO2- To apply the knowledge of electrical engineering to solve problems of social relevance and/or pursue higher education
3. PEO3- To work effectively as individuals and as team members in multidisciplinary projects by exhibit leadership capability, triggering social and economic commitment and inculcate community services and protect environment
4. PEO4- Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

Subject : UTILISATION OF ELECTRICAL ENERGY AND TRACTION			
Discipline: Electrical Engineering		Name of the Faculty: suchismita sahuo	
Course Code:	TH-4	Semester:	5th
Total Periods:	60	Examination:	2022(Winter)
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	100	End Semester Examination:	80

Week	Class	Period and week	Theory Topics
1st	1st	16/09/22 1p	INTRODUCTION Briefing Syllabus discussion
	2nd	17/9/2022 1p	1.ELECTROLYTIC PROCESS: 1.1 Definition and Basic principle of Electro Deposition. 1.2 Important terms regarding electrolysis.
2nd	1st	19/09/2022 1p	1.3 Faradays Laws of Electrolysis. 1.4 Definitions of current efficiency, Energy efficiency. 1.5 Principle of Electro Deposition.
	2nd	21/09/2022 1p	1.6 Factors affecting the amount of Electro Deposition. 1.7 Factors governing the electro deposition
	3rd	23/09/2022 1p	1.8 State simple example of extraction of metals. 1.9 Application of Electrolysis
	4th	24/9/2022 1p	REVISION AND DOUBT CLEARING
3rd	1st	26/09/2022 1p	2.ELECTRICAL HEATING: 2.1 Advantages of electrical heating.
	2nd	28/09/2022 1p	2.2 Mode of heat transfer and Stephen's Law. 2.3 Principle of Resistance heating. (Direct resistance and indirect resistance heating.)
	3rd	30/09/2022 1p	2.4 Discuss working principle of direct arc furnace and indirect arc furnace.
	4th	01/10/2022 1p	2.5 Principle of Induction heating. 2.5.1 Working principle of direct core type, vertical core type and indirect core type Induction furnace.
4th	1st	10/10/2022 1p	2.5.2 Principle of coreless induction furnace and skin effect.
	2nd	12/10/2022 1p	2.6 Principle of dielectric heating and its application.
	3rd	14/10/2022 1p	2.7 Principle of Microwave heating and its application .
	4th	15/10/2022 1p	REVISION AND DOUBT CLEARING
5th	1st	17/10/2022 1p	1st class test
	2nd	19/10/2022 1p	3.PRINCIPLES OF ARC WELDING: 3.1 Explain principle of arc welding. 3.2 Discuss D. C. & A. C. Arc phenomena.
	3rd	21/10/2022 1p	3.3 D.C. & A. C. arc welding plants of single and multi-operation type.
	4th	22/10/2022 1p	3.4 Types of arc welding.
6th	1st	26/10/2022 1p	3.5 Explain principles of resistance welding.
	2nd	28/10/2022 1p	3.6 Descriptive study of different resistance welding methods.

	3 rd	29/10/2022 1p	REVISION AND DOUBT CLEARING
7th	1 st	31/10/2022 1p	4.ILLUMINATION: 4.1 Nature of Radiation and its spectrum.
	3 rd	02/11/2022 1p	4.2 Terms used in Illuminations. [Lumen, Luminous intensity, Intensity of illumination, MHCP, MSCP, MHSCP, Solid angle, Brightness, Luminous efficiency.]
	4 th	04/11/2022 1p	4.3 Explain the inverse square law and the cosine law
	1 st	05/11/2022 1p	4.4 Explain polar curves. 4.5 Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors
8th	1 st	07/11/2022 1p	4.6 Design simple lighting schemes and depreciation factor.
	2 nd	09/11/2022 1p	4.7 Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps.
	3 rd	11/11/2022	4.8 Explain Discharge lamps. 4.9 State Basic idea about excitation in gas discharge lamps.
	4 th	12/11/2022 1p	4.10 State constructional features and operation of Fluorescent lamp. (PL and PLL Lamps)
9th	1 st	14/11/2022 1p	4.11 Sodium vapor lamps. 4.12 High pressure mercury vapor lamps
	2 nd	16/11/2022 1p	4.13 Neon sign lamps. 4.14 High lumen output & low consumption fluorescent lamps
	3 rd	18/11/2022 1p	REVISION AND DOUBT CLEARING
	4 th	19/11/2022 1p	INTERNAL ASSESSMENT
10th	1 st	21/11/2022 1p	5.INDUSTRIAL DRIVES: 5.1 State group and individual drive.
	2 nd	23/11/2022 1p	5.2 Method of choice of electric drives.
	3 rd	25/11/2022 1p	5.3 Explain starting and running characteristics of DC motor
	4 th	26/11/2022 1p	5.4 Explain starting and running characteristics of AC motor.
11th	1 st	28/11/2022 1p	5.5 State Application of: 5.5.1 DC motor.
	2 nd	30/12/2022 1p	5.5.2 3-phase induction motor.
	3 rd	02/12/2022 1p	5.5.3 3- phase synchronous motors.
	4 th	03/12/2022 1p	5.5.4 Series motor ,Single phase induction, Universal motor and repulsion motor
12th	1 st	05/12/2022 1p	REVISION AND DOUBT CLEARING
	2 nd	07/12/2022 1p	6.ELECTRIC TRACTION: 6.1 Explain system of traction.
	3 rd	09/12/2022 1p	6.2 System of Track electrification
	4 th	10/12/2022 1p	6.3 Running Characteristics of DC traction motor.

13th	1st	12/12/2022 1p	6.3 Running Characteristics of AC traction motor.
	2nd	14/12/2022 1p	6.4 Explain control of motor: 6.4.1 Tapped field control.
	3rd	16/12/2022 1p	6.4.2 Rheostatic control.
	4th	17/12/2022 1p	6.4.3 Multi-unit control.
14th	1st	19/12/22 1p	6.5 Explain Braking of the following types: 6.5.1 Regenerative Braking
	2nd	21/12/2022 1p	6.5.2 Braking with 1-phase series motor.
	3rd	23/12/2022 1p	6.5.3 Magnetic Braking.
	4th	24/12/2022 1p	REVISION
15th	1st	2/1/2023 1p	2nd class test
	2nd	4/1/2023 1p	DOUBT CLEARING
	3rd	6/1/2023 1p	Semester question paper discussion
	4th	7/1/2023 1p	Semester question paper discussion