LESSON PLAN

6th semester

Orissa School of Mining EngineeringKeonjhar

Department of Electrical Engineering

Lesson Plan

The Vision of the Electrical Engineering 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.

The Mission of Electrical Engineering 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. **PE02- To apply the knowledge of electrical engineering to solve problems of social relevance and/or pursue higher education**
3. **PE03- 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.**

Program Specific Outcome (PSOs)Program Outcome(POs):

Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

1. Problem Analysis: Identify and analyze well defined engineering problems using codified standard methods.
2. Design/development of solutions: Design solutions for well-defined technical problems and assist with the design of system components or processes to meet specified needs.
3. Engineering Tools,Experimentation and Testing : Apply modern engineering tools and appropriate technique to conduct standard tests and measurements .
4. Engineering Practices for Society ,Sustainability and Environment : Apply appropriate technology in context of society ,sustainability ,environment and ethical practices.
5. Project Management: Use engineering management principles individually ,as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities .
6. Life-long Learning : Ability to analyze individual needs and engage in updating in the context of technological changes.

Program Specific Outcome(PSOs)

PSO1:Apply engineering and laboratory skills for testing operation and maintenance of electrical machine ,power and energy system

PSO2:Model and analyze ,realize physical systems ,components or processes related to electrical engineering system

PSO3:work professionally in power system engineering ,electrical machine and circuit system

Subject : Th4.TESTING AND MAINTENANCE OF ELECTRICAL MACHINE (Elective- A)			
Discipline: **Electrical Engineering**		Name of the Faculty: **Er. Sitanjali Mardi**	
Course Code:	**TH- 4**	Semester:	**6th** 6th Sem
Total Periods:	**75**	Examination:	**Summer 2022-23**
Theory Periods:	**5P/W**	Class Test:	**20**
Maximum Marks:	**100**	End Semester Examination:	**80**

Week	NO OF PERIODS AVAILABLE	Class Day	Theory Topics to be covered	Remarks
1st	5	1st, 14.2.23	INTRODUCTION/BRIEFING,	
		2rd 15.2.23	**Chapter-1:Installation, Commissioning and Testing of Machine** 1.1 Inspection of arrival of machine 1.1 inspection procedure before its installation	
		3rd 17.2.23	1.2 Generalized procedure of installation of Electrical machines	
		4th,5th 20.2.23(2 class)	1.2 Generalized procedure of installation of Electrical machines 1.3 Electric wiring for motors and switch gears	
2nd	5	1st 22.2.23	.1.4General requirement for Electric Installation according to Indian Electricityrules	
		2nd 24.2.23	1.4General requirement for Electric Installation according to Indian Electricityrules	
		3rd,4th	1.5 Necessity of starters and relays for both DC and AC machines	

		27.2.23		
		5th 28.2.23	1.5 Necessity of starters and relays for both DC and AC machines	
3rd	5	1st 1.3.23	1.5 Necessity of starters and relays for both DC and AC machines	
		2nd 3.03.23	1.6 Testing before giving supply and testing report	
		3rd,4th 6.03.23	1.6 Testing before giving supply and testing report	
		5th 10.3.23	Revision class.	
4TH	5	1st,2nd 13.03.23	**Chapter 2-Installation, Commissioning and Testing of Transformer:** 2. 1 Basic idea on dispatch, inspection, storage and handling of transformer.	
		3rd, 14.03.23	2. 2 Civil construction feature regarding connection like ventilation, noise level,	
		4th, 15.03.23	2. 2 Civil construction feature regarding connection like ventilation, noise level,	
		5th 17.03.23	2. 3 Foundation and drainage of oil.	
5th	5	1st,2nd 20.3.23(2 class)	2. 4 Cabling and cable box for transformer.	
		3rd 21.03.23	2. 5 Provision for fire protection.	
		4th 22.03.23	2. 6 Provision for bushing support location of switch gear	
		,5th 24.03.23	CLASS TEST-1	
6th	5	1st,2nd 27.03.23	2. 7 Steps for commissioning fitting of all accessories	
		3rd 28.03.23	2. 8 Filling of oil, drying out	

		4th 29.03.23	2. 9 Charging the breather with fresh silica gel.	
		,5th 31.03.23	2. 10 Cleaning of bushing, fixing of conductor & cables, earthing of tank andcover, neutral earthing.	
7th	5	1st,2nd, 3.04.23	2. 11 Fixing of protection circuits and setting of relays	
		3rd 04.04.23	REVISION	
		4th 5.04.23	**Chapter-3:Installation, Commissioning & Testing of Sub-station** 3 . 1 Design and planning of indoor substation	
		,5th, 10.04.23	3.2 General requirement of layout of indoor substation with key diagram	
8th	5	1st, 10.4.23	3.3 Consideration of safe operation of substation.	
		2nd 11.4.23	3 . 4 Installation of outdoor substation: 3.4.1 Selection of site, transport & receipt of transformer, checking of insulation resistance of the winding, testing of transformer oil, protection fittings, construction of mounting, earthing arrangement and final commissioning.	
		3rd, 12.4.23	3.4.1 Selection of site, transport & receipt of transformer, checking of insulation resistance of the winding, testing of transformer oil, protection fittings, construction of mounting, earthing arrangement and final commissioning.	
		4th,5th 17.4.23	3.5.1 Installation of control and relay panels	
9th	5	1st, 18.4.23	3.5.2 Preliminary preparation.	
		2nd 19.4.23 & 20.04.2023	**INTERNAL ASSESSMENT**	
		3rd	3.5.3 Sequence card for erection of switch gear equipments	

		21.04.23		
		,4th ,5th 24.4.23	3.5.4 Location of place 3.5.5 Unpacking	
10th	5	1st, 25.4.23	3.5.6 Foundation 3.5.7 Erection 3.5.8 Relays	
		2nd, 26.4.23	3.6 Bus-bar earthing connection, Earthing 3.6.1 Connection to main cable.	
		3rd 28.4.23	3.6.2 Safety precaution	
		4th,,5th 1.5.23	3 . 7 Installation of outdoor circuit breaker: 3.7.1.Receipt and storage. 3.7.2 Civil works. 3.7.3 Various steps for installation	
11th	5	1st, 2.5.23	3.8 Pre-commissioning tests	
		2nd, 3.5.23	**REVISION**	
		3rd,4rth 8.5.23	**CLASS TEST 2** **Chapter-4 Maintenance:** 4.1 Fundamental of maintenance	
		5th 9.5.23	**Chapter-4 Maintenance:** 4.1 Fundamental of maintenance	
12th	5	1st, 10.5.23	4.2 Preventive maintenance and planning. [Daily, Weekly, Monthly, Half-yearly and Yearly maintenance.]	
		2rd 12.5.23	4.3 Advantages of Preventive maintenance	
		3rd,4th 15.5.23	4.4Breakdown maintenance: List of tools / instruments and materials used for maintenance.	
		5th 16.5.23	4.5 Making or Preparing Maintenance schedule of DC machines, Induction machines, Synchronous machines, Transformer, Transmission line, Distributionlines, Underground cables, Circuit	

			breakers, Switch gear and protective relays and substations, SF-6 circuit breakers, Batteries in substation.	
13th	4	1st, 17.5.23	4.5 Making or Preparing Maintenance schedule of DC machines, Induction machines, Synchronous machines, Transformer, Transmission line, Distributionlines, Underground cables, Circuit breakers, Switch gear and protective relays and substations, SF-6 circuit breakers, Batteries in substation.	
		2nd,3rd 22.5.23	**REVISION/ PYQS Discussion**	
		4rth 23.5.23	VST	
	Total class 64/75			

13/2/23 (HOD/Elect)
HOD

PRINCIPAL