GOVT. POLYTECHNIC KORAPUT
DEPARTMENT OF ELECTRICAL ENGG.

LESSON PLAN

Name of the faculty--:Mr.R.Hansda
Discipline----------:Electircal
Semester----------:6th
Subject----------:SWITCH GEAR AND PROTECTIVE DEVICES
Duration----------:total period -75
Work load per week-:5 II Class Test-20 II End semester exam-80

WEEK	THEORY	
	Lecture day	Topic
1	1	**1. INTRODUCTION TO SWITCHGEAR-6-**1.1 Essential Features of switchgear.
	2	1.2 Switchgear Equipment.
	3	1.3 Bus-Bar Arrangement.
	4	1.4 Switchgear Accommodation.
	5	Tutorial
2	1	1.5 Short Circuit.
	2	1.6 Short circuit.1.7 Faults in a power system
	3	**2. FAULT CALCULATION -10**-2.1 Symmetrical faults on 3-phase system.
	4	2.2 Limitation of fault current.
	5	Tutorial
3	1	2.3 Percentage Reactance.
	2	2.4 Percentage Reactance and Base KVA.
	3	2.5 Short – circuit KVA.
	4	2.6 Reactor control of short circuit currents.
	5	Tutorial
4	1	2.7 Location of reactors.
	2	2.8 Steps for symmetrical Fault calculations.
	3	2.9 Solve numerical problems on symmetrical fault.
	4	2.9 Solve numerical problems on symmetrical fault.
	5	Tutorial
5	1	**3. FUSES-6**-3.1 Desirable characteristics of fuse element.
	2	3.2 Fuse Element materials.
	3	3.3 Types of Fuses and important terms used for fuses.
	4	3.4 Low and High voltage fuses
	5	Tutorial
	1	3.5 Current carrying capacity of fuse element
	2	3.6 Difference Between a Fuse and Circuit Breaker.
	3	**4. CIRCUIT BREAKERS-10-**4.1 Definition and principle of Circuit Breaker. 4.2 Arc phenomenon and principle of Arc Extinction
	4	4.3 Methods of Arc Extinction. 4.4 Definitions of Arc voltage, Re-striking voltage and Recovery voltage
	5	Tutorial
6	1	4.5 Classification of circuit Breakers. 4.6 Oil circuit Breaker and its classification.
	2	4.7 Plain brake oil circuit breaker, 4.8 Arc control oil circuit breaker
	3	4.9 Low oil circuit breaker.

		4.10 Maintenance of oil circuit breaker.
	4	4.11 Air-Blast circuit breaker and its classification.
	5	Tutorial
	1	4.12 Sulphur Hexa-fluoride (SF6) circuit breaker. 4.13 Vacuum circuit breakers.
	2	4.14 Switchgear component. 4.15 Problems of circuit interruption
7	3	4.16 Resistance switching
	4	4.17 Circuit Breaker Rating
	5	Tutorial
	1	**5. PROTECTIVE RELAYS-8-**5.1 Definition of Protective Relay. 5.2 Fundamental requirement of protective relay.
	2	5.3 Basic Relay operation 5.3.1. Electromagnetic Attraction type 5.3.2. Induction type
	3	5.4 Definition of following important terms
8	4	5.5 Definition of following important terms. 5.5.1. Pick-up current. 5.5.2. Current setting. 5.5.3. Plug setting Multiplier. 5.5.4. Time setting Multiplier. 5.6 Classification of functional relays
	5	Tutorial
9	1	5.7 Induction type over current relay (Non-directional)
	2	5.8 Induction type directional power relay. 5.9 Induction type directional over current relay.
	3	5.10 Differential relay 5.10.1. Current differential relay. 5.10.2. Voltage balance differential relay.
	4	5.11 Types of protection
	5	Tutorial
9	1	**6. PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES-6-** 6.1 Protection of alternator. 6.2 Differential protection of alternators.
	2	6.3 Balanced earth fault protection. 6.4 Protection systems for transformer.
	3	6.5 Buchholz relay.
	4	6.6 Protection of Bus bar.
	5	Tutorial
10	1	6.7 Protection of Transmission line.
	2	6.8 Different pilot wire protection (Merz-price voltage Balance system) 6.9 Explain protection of feeder by over current and earth fault relay.
	3	**7. PROTECTION AGAINST OVER VOLTAGE AND LIGHTING-8** 7.1. Voltage surge and causes of over voltage. 7.2. Internal cause of over voltage.

	4	7.3. External cause of over voltage (lighting)
	5	Tutorial
11	1	7.4. Mechanism of lightning discharge.
	2	7.5. Types of lightning strokes
	3	7.6. Harmful effect of lightning.
	4	7.7. Lightning arresters and Type of lightning Arresters. 7.7.1. Rod-gap lightning arrester.
	5	Tutorial
	1	7.7.2. Horn-gap arrester. 7.7.3. Valve type arrester.
	2	7.8. Surge Absorber
	3	8. **STATIC RELAY-6**
12	4	8. 1 Advantage of static relay.
	5	Tutorial
	1	8. 2 Instantaneous over current relay.
	2	8. 3 Principle of IDMT relay.
	3	8. 3 Principle of IDMT relay.
	4	Tutorial
13	5	Tutorial
	2	Tutorial
	3	Tutorial
	4	Tutorial
		Tutorial
14	1	Tutorial
	2	Tutorial
	3	Tutorial
	4	Tutorial
		Tutorial
15	1	Tutorial
	2	Tutorial
	3	Tutorial
	4	Tutorial
		Tutorial

Signature of concerned faculty

H.O.D Electrical