

ACADEMIC LESSON PLAN OF SUMMER 2025

Discipline: Electrical Engineering	Semester: 6 th (SEC-B)	Name of the Teaching Faculty: SRI P.K DEV
Subject: TH-2 (SWITCH GEAR AND PROTECTIVE DEVICE)	No. of days/per week class allotted: 4p/week Tutorial: 1p/week	Semester From: 04 th FEBRUARY 2025 to 17 th MAY 2025 No. of weeks: 15 weeks
Week	Class Day	Theory Topics
1 st	1 st	1. INTRODUCTION TO SWITCHGEAR 1.1 Essential Features of switchgear. 1.2 Switchgear Equipment.
	2 nd	1.3 Bus-Bar Arrangement.
	3 rd	1.4 Switchgear Accommodation.
	4 th	1.5 Short Circuit.
	5 th	Tutorial Period
2 nd	1 st	1.6 Short circuit
	2 nd	1.7 Faults in a power system
	3 rd	2. FAULT CALCULATION 2.1 Symmetrical faults on 3-phase system.(Contd.)
	4 th	2.1 Symmetrical faults on 3-phase system.
	5 th	2.2 Limitation of fault current.
3 rd	1 st	Tutorial Period
	2 nd	2.3 Percentage Reactance. 2.4 Percentage Reactance and Base KVA.(Contd.)
	3 rd	2.4 Percentage Reactance and Base KVA.
	4 th	2.5 Short – circuit KVA
	5 th	Tutorial Period
4 th	1 st	2.6 Reactor control of short circuit currents.
	2 nd	2.7 Location of reactors.
	3 rd	2.8 Steps for symmetrical Fault calculations. 2.9 Solve numerical problems on symmetrical fault.(Contd.)
	4 th	2.9 Solve numerical problems on symmetrical fault.
	5 th	Tutorial Period
5 th	1 st	3. FUSES 3.1 Desirable characteristics of fuse element. 3.2 Fuse Element materials.
	2 nd	3.3 Types of Fuses and important terms used for fuses.
	3 rd	3.4 Low and High voltage fuses.(Contd.)
	4 th	3.4 Low and High voltage fuses.
	5 th	Tutorial Period
6 th	1 st	3.5 Current carrying capacity of fuse element.
	2 nd	3.6 Difference Between a Fuse and Circuit Breaker.
	3 rd	4. CIRCUIT BREAKERS 4.1 Definition and principle of Circuit Breaker.
	4 th	4.2 Arc phenomenon and principle of Arc Extinction. 4.3 Methods of Arc Extinction. 4.4 Definitions of Arc voltage, Re-striking voltage and Recovery voltage.

	5 th	Tutorial Period
7 th	1 st	4.5 Classification of circuit Breakers. 4.6 Oil circuit Breaker and its classification. 4.7 Plain break oil circuit breaker.
	2 nd	4.8 Arc control oil circuit breaker.
	3 rd	4.9 Low oil circuit breaker. 4.10 Maintenance of oil circuit breaker.
	4 th	4.11 Air-Blast circuit breaker and its classification.
	5 th	Tutorial Period
8 th	1 st	4.12 Sulphur Hexa-fluoride (SF6) circuit breaker.
	2 nd	4.13 Vacuum circuit breakers. 4.14 Switchgear component.
	3 rd	4.15 Problems of circuit interruption
	4 th	4.16 Resistance switching. 4.17 Circuit Breaker Rating.
	5 th	Tutorial Period
9 th	1 st	5. PROTECTIVE RELAYS 5.1 Definition of Protective Relay.
	2 nd	5.2 Fundamental requirement of protective relay.
	3 rd	5.3 Basic Relay operation
	4 th	5.3.1 Electromagnetic Attraction type 5.3.2 Induction type
	5 th	Tutorial Period
10 th	1 st	5.4 Definition of following important terms 5.5 Definition of following important terms
	2 nd	5.5.1 Pick-up current.
	3 rd	5.5.2 Current setting. 5.5.3 Plug setting Multiplier. 5.5.4 Time setting Multiplier.
	4 th	5.6 Classification of functional relays 5.7 Induction type over current relay (Non-directional)
	5 th	Tutorial Period
11 th	1 st	5.8 Induction type directional power relay.
	2 nd	5.9 Induction type directional over current relay.
	3 rd	5.10 Differential relay 5.10.1 Current differential relay 5.10.2 Voltage balance differential relay
	4 th	5.11 Types of protection
	5 th	Tutorial Period
12 th	1 st	6. PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES 6.1 Protection of alternator. 6.2 Differential protection of alternators.
	2 nd	6.3 Balanced earth fault protection.
	3 rd	6.4 Protection systems for transformer. 6.5 Buchholz relay.
	4 th	6.6 Protection of Bus bar. 6.7 Protection of Transmission line.
	5 th	Tutorial Period
13 th	1 st	6.8 Different pilot wire protection (Merz-price voltage Balance system)
	2 nd	6.9 Explain protection of feeder by over current and earth fault relay.
	3 rd	7. PROTECTION AGAINST OVER VOLTAGE AND LIGHTING 7.1 Voltage surge and causes of over voltage. 7.2 Internal cause of over voltage.
	4 th	7.3 External cause of over voltage (lighting)
	5 th	Tutorial Period
14 th	1 st	7.4 Mechanism of lightning discharge.(Contd.)

	2 nd	7.5 Types of lightning strokes.
	3 rd	7.6 Harmful effect of lightning. 7.7 Lightning arresters and Type of lightning Arresters.
	4 th	7.7.1 Rod-gap lightning arrester 7.7.2 Horn-gap arrester
	5 th	Tutorial Period
15 th (Extra Class)	1 st	7.7.3 Valve type arrester.
	2 nd	7.8 Surge Absorber
	3 rd	8. STATIC RELAY 8.1 Advantage of static relay.(Contd.)
	4 th	8.1 Advantage of static relay.
	5 th	Tutorial Period



Signature of Teaching Faculty

