ACADEMIC LESSON PLAN OF SUMMER 2022

Discipline: Electrical Engineering	Semester: 6th(1st Shift)	Name of the Teaching Faculty: Ananya Shubhadarsinee
Subject:TH-2 (SWITCH GEAR AND PROTECTIVE DEVICE)	No. of days/per week class allotted:4p/week Tutorial:1p/week	Semester From: 10thMarch 2022 to 10th June 2022
Week	Class Day	Theory Topics
1st	14-03-2022	**1. INTRODUCTION TO SWITCHGEAR** 1.1 Essential Features of switchgear. 1.2 Switchgear Equipment.
	14-03-2022	1.3 Bus-Bar Arrangement.
	15-03-2022	1.4 Switchgear Accommodation.
	15-03-2022	1.5 Short Circuit.
	16-03-2022	Tutorial Period
2nd	21-03-2022	1.6 Short circuit
	21-03-2022	1.7 Faults in a power system
	22-03-2022	**2. FAULT CALCULATION** 2.1 Symmetrical faults on 3-phase system.(Contd.)
	22-03-2022	2.1 Symmetrical faults on 3-phase system.
	23-03-2022	2.2 Limitation of fault current.
3rd	28-03-2022	Tutorial Period
	28-03-2022	2.3 Percentage Reactance. 2.4 Percentage Reactance and Base KVA.(Contd.)
	29-03-2022	2.4 Percentage Reactance and Base KVA.
	29-03-2022	2.5 Short – circuit KVA
	30-03-2022	Tutorial Period
4th	04-04-2022	2.6 Reactor control of short circuit currents.
	04-04-2022	2.7 Location of reactors.
	05-04-2022	2.8 Steps for symmetrical Fault calculations. 2.9 Solve numerical problems on symmetrical fault.(Contd.)
	05-04-2022	2.9 Solve numerical problems on symmetrical fault.
	06-04-2022	Tutorial Period
5th	11-04-2022	**3. FUSES** 3.1 Desirable characteristics of fuse element. 3.2 Fuse Element materials.
	11-04-2022	3.3 Types of Fuses and important terms used for fuses.
	12-04-2022	3.4 Low and High voltage fuses.(Contd.)
	12-04-2022	3.4 Low and High voltage fuses.
	13-04-2022	Tutorial Period
6th	18-04-2022	3.5 Current carrying capacity of fuse element.
	18-04-2022	3.6 Difference Between a Fuse and Circuit Breaker.
	19-04-2022	**4. CIRCUIT BREAKERS** 4.1 Definition and principle of Circuit Breaker.
	19-04-2022	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.
	20-04-2022	Tutorial Period
7th	25-04-2022	4.5 Classification of circuit Breakers. 4.6 Oil circuit Breaker and its classification. 4.7 Plain brake oil circuit breaker.
	25-04-2022	4.8 Arc control oil circuit breaker.
	26-04-2022	4.9 Low oil circuit breaker. 4.10 Maintenance of oil circuit breaker.
	26-04-2022	4.11 Air-Blast circuit breaker and its classification.
	27-04-2022	Tutorial Period
8th	02-05-2022	4.12 Sulphur Hexa-fluoride (SF6) circuit breaker.
	02-05-2022	4.13 Vacuum circuit breakers. 4.14 Switchgear component.
	03-05-2022	HOLIDAY
	03-05-2022	HOLIDAY

	04-05-2022	Tutorial Period
9th	09-05-2022	4.15 Problems of circuit interruption
	09-05-2022	4.16 Resistance switching. 4.17 Circuit Breaker Rating.
	10-05-2022	**5. PROTECTIVE RELAYS** 5.1 Definition of Protective Relay. 5.2 Fundamental requirement of protective relay.
	10-05-2022	5.3 Basic Relay operation 5.3.1 Electromagnetic Attraction type 5.3.2 Induction type
	11-05-2022	Tutorial Period
10th	16-05-2022	HOLIDAY
	16-05-2022	HOLIDAY
	17-05-2022	5.4 Definition of following important terms 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.
	17-05-2022	5.6 Classification of functional relays 5.7 Induction type over current relay (Non-directional)
	18-05-2022	Tutorial Period
11th	23-05-2022	5.8 Induction type directional power relay.
	23-05-2022	5.9 Induction type directional over current relay.
	24-05-2022	5.10 Differential relay 5.10.1 Current differential relay 5.10.2 Voltage balance differential relay
	24-05-2022	5.11 Types of protection
	25-05-2022	Tutorial Period
12th	30-05-2022	**6. PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES** 6.1 Protection of alternator. 6.2 Differential protection of alternators.
	30-05-2022	6.3 Balanced earth fault protection.
	31-05-2022	6.4 Protection systems for transformer. 6.5 Buchholz relay.
	31-05-2022	6.6 Protection of Bus bar. 6.7 Protection of Transmission line.
	01-06-2022	Tutorial Period
13th	06-05-2022	6.8 Different pilot wire protection (Merz-price voltage Balance system)
	06-05-2022	6.9 Explain protection of feeder by over current and earth fault relay.
	07-05-2022	**7. PROTECTION AGAINST OVER VOLTAGE AND LIGHTING** 7.1 Voltage surge and causes of over voltage. 7.2 Internal cause of over voltage.
	07-05-2022	7.3 External cause of over voltage (lighting)
	08-05-2022	Tutorial Period
14th (Extra Class)	EXTRA CLASS	7.4 Mechanism of lightning discharge.(Contd.)
	EXTRA CLASS	7.5 Types of lightning strokes.
	EXTRA CLASS	7.6 Harmful effect of lightning. 7.7 Lightning arresters and Type of lightning Arresters.
	EXTRA CLASS	7.7.1 Rod-gap lightning arrester 7.7.2 Horn-gap arrester
	EXTRA CLASS	Tutorial Period
15th (Extra Class)	EXTRA CLASS	7.7.3 Valve type arrester.
	EXTRA CLASS	7.8 Surge Absorber
	EXTRA CLASS	**8. STATIC RELAY** 8.1 Advantage of static relay.(Contd.)
	EXTRA CLASS	8.1 Advantage of static relay.
	EXTRA CLASS	Tutorial Period
(Extra Class)	EXTRA CLASS	8.2 Instantaneous over current relay.(Contd.)
	EXTRA CLASS	8.2 Instantaneous over current relay.
	EXTRA CLASS	8.3 Principle of IDMT relay.(Contd.)
	EXTRA CLASS	8.3 Principle of IDMT relay.
	EXTRA CLASS	Tutorial Period

Signature of Teaching Faculty

ACADEMIC LESSON PLAN OF SUMMER 2022

Discipline: Electrical Engineering	Semester: 6th(2nd Shift)	Name of the Teaching Faculty: Ananya Shubhadarsinee
Subject:TH-2 (SWITCH GEAR AND PROTECTIVE DEVICE)	No. of days/per week class allotted:4p/week Tutorial:1p/week	Semester From: 10thMarch 2021 to 10th June 2022
Week	Class Day	Theory Topics
1st	10-03-2022	**1. INTRODUCTION TO SWITCHGEAR** 1.1 Essential Features of switchgear. 1.2 Switchgear Equipment.
	11-03-2022	1.3 Bus-Bar Arrangement.
	12-03-2022	1.4 Switchgear Accommodation.
	12-03-2022	1.5 Short Circuit.
	14-03-2022	Tutorial Period
2nd	17-03-2022	1.6 Short circuit
	18-03-2022	HOLIDAY
	19-03-2022	HOLIDAY
	19-03-2022	HOLIDAY
	21-03-2022	Tutorial Period
3rd	24-03-2022	1.7 Faults in a power system
	25-03-2022	**2. FAULT CALCULATION** 2.1 Symmetrical faults on 3-phase system.(Contd.)
	26-03-2022	2.1 Symmetrical faults on 3-phase system.
	26-03-2022	2.2 Limitation of fault current.
	28-03-2022	Tutorial Period
4th	31-03-2022	2.3 Percentage Reactance. 2.4 Percentage Reactance and Base KVA.(Contd.)
	01-04-2022	HOLIDAY
	02-04-2022	2.4 Percentage Reactance and Base KVA.
	02-04-2022	2.5 Short – circuit KVA
	04-04-2022	Tutorial Period
5th	07-04-2022	2.6 Reactor control of short circuit currents.
	08-04-2022	2.7 Location of reactors.
	09-04-2022	2.8 Steps for symmetrical Fault calculations. 2.9 Solve numerical problems on symmetrical fault.(Contd.)
	09-04-2022	2.9 Solve numerical problems on symmetrical fault.
	11-04-2022	Tutorial Period
6th	14-04-2022	HOLIDAY
	15-04-2022	HOLIDAY
	16-04-2022	**3. FUSES** 3.1 Desirable characteristics of fuse element. 3.2 Fuse Element materials.
	16-04-2022	3.3 Types of Fuses and important terms used for fuses.
	18-04-2022	3.4 Low and High voltage fuses.(Contd.)
7th	21-04-2022	3.4 Low and High voltage fuses.
	22-04-2022	Tutorial Period
	23-04-2022	3.5 Current carrying capacity of fuse element.
	23-04-2022	3.6 Difference Between a Fuse and Circuit Breaker.
	25-04-2022	**4. CIRCUIT BREAKERS** 4.1 Definition and principle of Circuit Breaker.
8th	28-04-2022	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.
	29-04-2022	4.5 Classification of circuit Breakers. 4.6 Oil circuit Breaker and its classification. 4.7 Plain brake oil circuit breaker.
	30-04-2022	4.8 Arc control oil circuit breaker
	30-04-2022	4.9 Low oil circuit breaker.

		4.10 Maintenance of oil circuit breaker
	02-05-2022	Tutorial Period
9th	05-05-2022	4.11 Air-Blast circuit breaker and its classification.
	06-05-2022	4.12 Sulphur Hexa-fluoride (SF6) circuit breaker.
	07-05-2022	4.13 Vacuum circuit breakers. 4.14 Switchgear component.
	07-05-2022	4.15 Problems of circuit interruption
	09-05-2022	Tutorial Period
10th	12-05-2022	4.16 Resistance switching. 4.17 Circuit Breaker Rating.
	13-05-2022	**5. PROTECTIVE RELAYS** 5.1 Definition of Protective Relay. 5.2 Fundamental requirement of protective relay.
	14-05-2022	5.3 Basic Relay operation 5.3.1 Electromagnetic Attraction type 5.3.2 Induction type
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	16-05-2022	HOLIDAY
11th	19-05-2022	5.6 Classification of functional relays 5.7 Induction type over current relay (Non-directional)
	20-05-2022	Tutorial Period
	21-05-2022	5.8 Induction type directional power relay.
	21-05-2022	5.9 Induction type directional over current relay.
	23-05-2022	Tutorial Period
12th	26-05-2022	5.10 Differential relay 5.10.1 Current differential relay 5.10.2 Voltage balance differential relay
	27-05-2022	5.11 Types of protection
	28-05-2022	**6. PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES** 6.1 Protection of alternator. 6.2 Differential protection of alternators.
	28-05-2022	6.3 Balanced earth fault protection.
	30-05-2022	HOLIDAY
13th	02-05-2022	6.4 Protection systems for transformer. 6.5 Buchholz relay.
	03-05-2022	6.6 Protection of Bus bar. 6.7 Protection of Transmission line.
	04-05-2022	6.8 Different pilot wire protection (Merz-price voltage Balance system)
	04-05-2022	6.9 Explain protection of feeder by over current and earth fault relay.
	06-05-2022	Tutorial Period
14th	09-06-2022	**7. PROTECTION AGAINST OVER VOLTAGE AND LIGHTING** 7.1 Voltage surge and causes of over voltage. 7.2 Internal cause of over voltage.
	10-06-2022	7.3 External cause of over voltage (lighting)
	EXTRA CLASS	7.4 Mechanism of lightning discharge.(Contd.)
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15th (Extra Class)	EXTRA CLASS	7.6 Harmful effect of lightning. 7.7 Lightning arresters and Type of lightning Arresters.
	EXTRA CLASS	7.7.1 Rod-gap lightning arrester 7.7.2 Horn-gap arrester
	EXTRA CLASS	Tutorial Period
	EXTRA CLASS	7.7.3 Valve type arrester.
	EXTRA CLASS	7.8 Surge Absorber
16th (Extra Class)	EXTRA CLASS	**8. STATIC RELAY** 8.1 Advantage of static relay.(Contd.)
	EXTRA CLASS	8.1 Advantage of static relay.
	EXTRA CLASS	Tutorial Period
	EXTRA CLASS	8.2 Instantaneous over current relay.(Contd.)
	EXTRA CLASS	8.2 Instantaneous over current relay.

17th (Extra Class)	EXTRA CLASS	8.3 Principle of IDMT relay.(Contd.)
	EXTRA CLASS	8.3 Principle of IDMT relay.
	EXTRA CLASS	Tutorial Period

Signature of Teaching Faculty