

LESSON PLAN
GOVT POLYTECHNIC KALAHANDI, BHAWANIPATNA

Faculty Name: SATYAJIT MOHANTY **BRANCH:** ELECTRICAL **SEM:** 6TH **SESSION:**2022-23(S)

SUBJECT: Project Work	No. of days/ week Class allotted: 8 Total Periods: 120	w.e.f. 14.02.2023 to 25.05.23
Week	Class Day(no of periods)	Theory
1 st	1 st (3P)	1. Selection of project assignment & project work
	2 nd (2P)	-do-
	3 rd (3P)	-do-
2 nd	1 st (3P)	-do-
	2 nd (2P)	-do-
	3 rd (3P)	2. Planning and execution of considerations & project work
3 rd	1 st (3P)	-do-
	2 nd (2P)	-do-
	3 rd (3P)	-do-
4 th	1 st (3P)	-do-
	2 nd (2P)	3. Quality of performance & project work
	3 rd (3P)	-do-
5 th	1 st (3P)	-do-
	2 nd (2P)	-do-
	3 rd (3P)	-do-
6 th	1 st (3P)	4. Providing solution of the problems or production of final product & project work
	2 nd (2P)	-do-
	3 rd (3P)	-do-
7 th	1 st (3P)	-do-
	2 nd (2P)	-do-
	3 rd (3P)	5. Sense of responsibility & project work
8 th	1 st (3P)	-do-
	2 nd (2P)	-do-
	3 rd (3P)	-do-
9 th	1 st (3P)	-do-
	2 nd (2P)	6. Self-expression/ communication/ Presentation skills & project work
	3 rd (3P)	-do-
10 th	1 st (3P)	-do-
	2 nd (2P)	-do-
	3 rd (3P)	-do-
11 th	1 st (3P)	7. Interpersonal skills/human relations & project work
	2 nd (2P)	-do-
	3 rd (3P)	-do-
12 th	1 st (3P)	-do-
	2 nd (2P)	-do-
	3 rd (3P)	8. Report writing skills & project work
13 th	1 st (3P)	-do-

	2 nd (2P)	-do-
	3 rd (3P)	-do-
14 th	1 st (3P)	-do-
	2 nd (2P)	9. Viva voce
	3 rd (3P)	-do-
15 th	1 st (3P)	-do-
	2 nd (2P)	-do-
	3 rd (3P)	-do-

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LESSON PLAN

GOVT POLYTECHNIC KALAHANDI, BHAWANIPATNA

Faculty Name: SATYAJIT MOHANTY

BRANCH: ELECTRICAL

SEM: 5TH

SESSION: 2022-23(S)

SUBJECT: RES	No. of days/ week Class allotted: 5 Total Periods: 75	w.e.f. 14.02.2023 to 25.05.23
Week	Class Day	Theory
1 st	1 st	1. Introduction to Renewable energy: 1.1. Environmental consequences of fossil fuel use.
	2 nd	1.2. Importance of renewable sources of energy.
	3 rd	1.3. Sustainable Design and development.
	4 th	1.4 Types of RE sources.
	5 th	1.5. Limitations of RE sources.
2 nd	1 st	1.6. Present Indian and international energy scenario of conventional and RE sources
	2 nd	TUTORIAL Chapter 1
	3 rd	-do-
	4 th	2. Solar Energy:
	5 th	2.1. Solar photovoltaic system-Operating principle.
3 rd	1 st	2.2. Photovoltaic cell concepts
	2 nd	2.2.1. Cell, module, array, Series and parallel connections. Maximum power point tracking (MPPT).
	3 rd	-DO-
	4 th	-DO-
	5 th	-DO-
4 th	1 st	2.3. Classification of energy Sources.
	2 nd	2.4. Extra-terrestrial and terrestrial Radiation.
	3 rd	-DO-
	4 th	2.5. Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant.
	5 th	-DO-
5 th	1 st	2.6. Solar collectors, Types and performance characteristics,
	2 nd	2.7. Applications: Photovoltaic - battery charger, domestic lighting, street lighting, water pumping, solar cooker, Solar Pond.
	3 rd	-DO-
	4 th	-DO-
	5 th	-DO-
6 th	1 st	TUTORIAL Chapter 2
	2 nd	-do-
	3 rd	-do-
	4 th	3. Wind Energy:
	5 th	3.1. Introduction to Wind energy.
7 th	1 st	3.2. Wind energy conversion.
	2 nd	3.3. Types of wind turbines
	3 rd	3.4. Aerodynamics of wind rotors.
	4 th	3.5. Wind turbine control systems; conversion to electrical power:
	5 th	3.6. Induction and synchronous generators.
8 th	1 st	3.7. Grid connected and self excited induction generator operation.
	1 st	-DO-
		3.8. Constant voltage and constant frequency generation with power electronic

		control.
	2 nd	3.9. Single and double output systems.
	3 rd	3.10. Characteristics of wind power plant.
	4 th	TUTORIAL Chapter 3
	5 th	-do-
9 th	1 st	-do-
	2 nd	CLASS TEST
	3 rd	4. Biomass Power: 4.1. Energy from Biomass 4.2. Biomass as Renewable Energy Source
	4 th	4.3. Types of Biomass Fuels - Solid, Liquid and Gas.
	5 th	-DO-
10 th	1 st	4.4. Combustion and fermentation.
	2 nd	-DO-
	3 rd	4.5. Anaerobic digestion.
	4 th	4.6. Types of biogas digester
	5 th	4.7. Wood gassifier.
11 th	1 st	4.8. Pyrolysis,.
	2 nd	4.9. Applications: Bio gas, Bio diesel
	3 rd	-DO-
	4 th	TUTORIAL Chapter 4
	5 th	-do-
12 th	1 st	-do-
	2 nd	5. Other Energy Sources 5.1. Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems
	3 rd	-DO-
	4 th	5.2. Ocean Thermal Energy Conversion (OTEC).
	5 th	-DO-
13 th	1 st	5.3. Geothermal Energy – Classification.
	2 nd	-DO-
	3 rd	5.4. Hybrid Energy Systems.
	4 th	-DO-
	5 th	-DO-
14 th	1 st	5.5. Need for Hybrid Systems
	2 nd	-DO-
	3 rd	5.6. Diesel-PV, Wind-PV, Microhydel-PV.
	4 th	-DO-
	5 th	-DO-
15 th	1 st	-DO-
	2 nd	TUTORIAL Chapter 5
	3 rd	-do-
	4 th	-do-
	5 th	Doubt clearing Session

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LESSON PLAN

GOVT POLYTECHNIC KALAHANDI, BHAWANIPATNA

Faculty Name: BHUBANTA KAND

BRANCH: ELECTRICAL SEM: 6TH

SESSION:2022-23(S)

SUBJECT: SGPD	No. of days/ week Class allotted: 5 Total Periods: 75	w.e.f. 14.02.2023 to 25.05.23
Week	Class Day	Theory
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	1.6 Short Circuit Current
2 nd	1 st	1.7 Faults in a power system.
	2 nd	TUTORIAL Chapter 1
	3 rd	-do-
	4 th	2. FAULT CALCULATION 2.1 Symmetrical faults on 3-phase system.
3 rd	5 th	2.2 Limitation of fault current.
	1 st	2.3 Percentage Reactance.
	2 nd	2.4 Percentage Reactance and Base KVA.
	3 rd	2.5 Short – circuit KVA.
	4 th	2.6 Reactor control of short circuit currents.
4 th	5 th	2.7 Location of reactors.
	1 st	2.8 Steps for symmetrical Fault calculations.
	2 nd	2.9 Solve numerical problems on symmetrical fault.
	3 rd	-do-
	4 th	TUTORIAL Chapter 2
5 th	5 th	-do-
	1 st	3. FUSES 3.1 Desirable characteristics of fuse element.
	2 nd	3.2 Fuse Element materials.
	3 rd	3.3 Types of Fuses and important terms used for fuses.
	4 th	3.4 Low and High voltage fuses.
6 th	5 th	3.5 Current carrying capacity of fuse element.
	1 st	3.6 Difference Between a Fuse and Circuit Breaker.
	2 nd	TUTORIAL Chapter 3
	3 rd	-do-
	4 th	4.CIRCUIT BREAKERS 4.1 Definition and principle of Circuit Breaker.
7 th	5 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.
	1 st	4.5 Classification of circuit Breakers. 4.6 Oil circuit Breaker and its classification.
	2 nd	4.7 Plain brake oil circuit breaker. 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	4.12 Sulphur Hexa-fluoride (SF6) circuit breaker.
8 th	1 st	4.13 Vacuum circuit breakers.
	2 nd	4.14 Switchgear component.
	3 rd	4.15 Problems of circuit interruption.
	4 th	4.16 Resistance switching.
	5 th	4.17 Circuit Breaker Rating.
		TUTORIAL Chapter 4
		-do-
9 th	1 st	5. PROTECTIVE RELAYS 5.1 Definition of Protective Relay. 5.2 Fundamental requirement of protective relay. 5.3 Basic Relay operation
	2 nd	5.3.1. Electromagnetic Attraction type 5.3.2. Induction type
	3 rd	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.
	4 th	5.6 Classification of functional relays 5.7 Induction type over current relay (Non-directional)
10 th	5 th	5.8 Induction type directional power relay.
	1 st	5.9 Induction type directional over current relay.
	2 nd	5.10 Differential relay 5.10.1. Current differential relay
	3 rd	5.10.2. Voltage balance differential relay. 5.11 Types of protection
	4 th	TUTORIAL Chapter 5
	5 th	-do-
11 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.
	5 th	6.7 Protection of Transmission line. 6.8 Different pilot wire protection (Merz-price voltage Balance system)
12 th	1 st	6.9 Explain protection of feeder by over current and earth fault relay.
	2 nd	TUTORIAL Chapter 6
	3 rd	-do-
	4 th	7. PROTECTION AGAINST OVER VOLTAGE AND LIGHTING 7.1. Voltage surge and causes of over voltage.
13 th	5 th	7.2. Internal cause of over voltage.
	1 st	7.3. External cause of over voltage (lighting)
	2 nd	7.4. Mechanism of lightning discharge.
	3 rd	7.5. Types of lightning strokes.
	4 th	7.6. Harmful effect of lightning.
	5 th	7.7. Lightning arresters and Type of lightning Arresters. 7.7.1. Rod-gap lightning arrester. 7.7.2. Horn-gap arrester.

14 th		7.7.3. Valve type arrester.
	1 st	7.8. Surge Absorber
	2 nd	TUTORIAL Chapter 7
	3 rd	-do-
	4 th	8. STATIC RELAY: 8. 1 Advantage of static relay.
	5 th	8. 2 Instantaneous over current relay.
15 th	1 st	8. 3 Principle of IDMT relay.
	2 nd	-do-
	3 rd	TUTORIAL Chapter 8
	4 th	-do-
		Doubt Clearing

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LESSON PLAN

GOVT POLYTECHNIC KALAHANDI, BHAWANIPATNA

Faculty Name: **BHUBANTA KAND**

BRANCH: ELECTRICAL SEM: 6TH

SESSION:2022-23(S)

SUBJECT: Electrical Work Shop	No. of days/ week Class allotted: 6 Total Periods: 60	w.e.f. 14.02.2023 to 25.05.23
Week	Class Period	Theory
1 st	1 st 2 nd 3 rd	1. Identification of single core (SC), twin core (TC), three cores (3c), four cores (4c); copper and aluminum PVC, VIR & Weather proof (WP) wire and prepare Britannia T- joint and Married joint.
	4 th 5 th 6 th	-do-
2 nd	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	2. Cutting copper and aluminum cable and crimping lug to them from 2.5mm ² to 6 mm ² cross section.
3 rd	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	3. Connection and testing of fluorescent tube light, high pressure M.V. lamp, sodium vapor lamp, M.H lamp, CFL and latest model lamps – measure inductance, Lux/ lumens (intensity of illumination) in each case-prepare lux table .
4 th	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	-do-
5 th	1 st 2 nd 3 rd	4. Study battery charger and make charging of lead acid battery (record charging voltage, current and specific gravity).
	4 th 5 th 6 th	-do-
6 th	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	5. Erection of residential building wiring by CTS and conduit wiring system using main two points and test installation by test lamp method and a meggar.
7 th	1 st 2 nd 3 rd	-do-

	4 th 5 th 6 th	-do-
8 th	1 st 2 nd 3 rd	6. Fault finding & repairing of Ceiling Fan – prepare an inventory list of parts.
	4 th 5 th 6 th	-do-
9 th	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	7. Find out fault of D.C. generator, repair and test it to run.
10 th	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	8. Find out fault of D.C. motor starters and A.C motor starter – prepare an inventory list of parts used in different starters.
11 th	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	9. Dismantle, over haul and assemble a single phase induction motor. Test and run it. – prepare an inventory list.
12 th	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	-do-
13 th	1 st 2 nd 3 rd	10. Dismantle over haul and assemble a three phase squirrel cage and phase wound motor. Test and run them.
	4 th 5 th 6 th	-do-
14 th	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	11. Overhaul a single phase and 3-phase variac.
15 th	1 st 2 nd 3 rd	-do-
	4 th 5 th 6 th	-do-

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