



GOVERNMENT POLYTECHNIC KORAPUT

Th1. ELECTRICAL INSTALLATION AND ESTIMATING

Name of the Course: Diploma in Electrical Engineering			
Faculty: Mahesh Kumar Biswal <i>Semester Duration: 10/03/2022 to 10/06/2022</i>			
Course code:	Th1	Semester	6 th
Total Period:	60		
Theory periods:	4P/week	Examination	3hrs
Tutorial:	1 P / week	Internal Assessment :	20
Maximum marks:	100	End Semester Examination:	80

DEPARTMENT OF ELECTRICAL

Vision:-

To create competent and industry ready Electrical diploma engineers with professional and social values to meet future challenges.

Mission:-

- To prepare diploma holders through “qualitative competency based education system” to compete with national requirement along with core values
- To produce dynamic Electrical Engineers to serve the society and industry .
- To develop leadership qualities, communication skills, critical thinking and attitude for Lifelong learning.

Program educational objectives:-

PEO1:	Apply technical knowledge and skills learned in the field of Electrical Engineering to excel in professional and/or higher education.
PEO2:	to provide students an excellent academic environment and make them aware the needs of Society and Industry to become a successful Professional/Entrepreneur.
PEO3:	To engage in lifelong learning, career enhancement to adopt emerging technologies

Course outcomes:-

C01	Use of basic rules and regulation to estimate over head services lines.
C02	Demonstrate the detailed specification requirement of different materials used in wiring
C03	Apply engineering architecture for estimating of distribution substation.
C04	Employ in independent and lifelong learning activities in the context of technology changes in the electrical engineering and allied industry.



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TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	Periods
1.	Indian electricity rules	06
2.	Electrical installations	12
3.	Internal wiring	12
4.	Over head installation	12
5.	Over head service lines	12
6.	Estimating for distribution substations	06
TOTAL		60

LESSON PLAN

Week	Day	Theory topic
1 st	1 st	INDIAN ELECTRICITY RULES: Definitions, Ampere, Apparatus, Accessible, Bare, cable, circuit, circuit breaker
	2 nd	conductor voltage (low, medium, high, EH), live, dead, cut-out, conduit, system, danger, Installation, earthing system, span, volt, switch gear, etc.
	3 rd	General safety precautions, rule 29, 30, 31, 32, 33, 34, 35, 36, 40, 41, 43, 44, 45, 46.
	4 th	General conditions relating to supply and use of energy: rule 47, 48, 49, 50, 51, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 70.
	5 th (Tutorial class)	OH lines : Rule 74, 75, 76, 77, 78, 79, 80, 86, 87, 88, 89, 90, 91 and some questions
2 nd	1 st	ELECTRICAL INSTALLATIONS: Electrical installations, domestics, industrial. Wiring System, Internal distribution of Electrical Energy.
	2 nd	Methods of wiring, systems of wiring, wire and cable, conductor materials used in cables, insulating materials mechanical protection
	3 rd	Types of cables used in internal wiring, multi-stranded cables, voltage grinding of cables, general specifications of cables.
	4 th	ACCESSORIES: Main switch and distribution boards, conduits, conduit accessories and fittings, lighting accessories and fittings.
	5 th (Tutorial class)	, important definitions, determination of size of fuse – wire, fuse units. Earthing conductor, earthing
3 rd	1 st	fuses IS specifications regarding earthing of electrical installations, points to be earthed
	2 nd	LIGHTING SCHEME: Aspects of good lighting services. Types of lighting schemes
	3 rd	design of lighting schemes, factory lighting, public lighting installations, street lighting, general rules for wiring
	4 th	Determination of size of earth wire and earth plate for domestic and industrial installations. Material required for GI pipe earthing and solved problem..
	5 th (Tutorial class)	Determination of number of points (light, fan, socket, outlets), determination of total load, determination of Number of sub-circuits.
4 th	1 st	INTERNAL WIRING: Type of internal wiring, cleat wiring, CTS wiring, wooden casing capping.
	2 nd	Metal sheathed wiring, conduit wiring, their advantage and disadvantages comparison and applications.

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	3 rd	Prepare one estimate of materials required for CTS wiring for small domestic installation of one room and one verandah within 25 m ² with given light, fan & plugpoints
	4 th	do
	5 th (Tutorial class)	Prepare one estimate of materials required for conduit wiring for small domestic installation of one room and one verandah within 25 m ² with given light, fan & plug points.
5 th	1 st	Prepare one estimate of materials required for concealed wiring
	2 nd	Estimation for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen & verandah within 80m ² with given light, fan & plug points.
	3 rd	Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m ² and load within 10 KW.
	4 th	Solved problems on internal wiring
	5 th (Tutorial class)	Solved problems on internal wiring
6 th	1 st	OVER HEAD INSTALLATION: Main components of overhead lines, line supports, factors Governing Height of pole
	2 nd	determination of size of conductor for overhead conductor materials transmission line, cross arms
	3 rd	pole brackets and clamps, guys and stays, conductors configurations, spacing and clearances, span lengths
	4 th	overhead line insulators, types of insulators, lighting arresters, danger plates, anti-climbing devices,
	5 th (Tutorial class)	Solved problems and examples
7 th	1 st	Bird guards, beads of jumpers, jumpers, tee-offs, guarding of overhead lines
	2 nd	Prepare an estimate of materials required for LT distribution line within load of 100KW maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consideration using ACSR.
	3 rd	do
	4 th	Prepare an estimate of materials required for LT distribution line within load of 100 KW maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consideration using ACSR
	5 th (Tutorial class)	do
8 th	1 st	do
	2 nd	do
	3 rd	Prepare an estimate of materials required for HT distribution line (11 KV) within 2 km and load of 2000 KVA maximum and standard spans involving calculation of the size of conductor.
	4 th	Prepare an estimate of materials required for HT distribution line (11 KV) within 2 km and load of 2000 KVA maximum and standard spans involving calculation of the size of conductor
	5 th (Tutorial class)	Solved questions and answer
9 th	1 st	(from conductor chart), current carrying capacity and voltage regulation of the size of conductor (from conductor chart). current carrying capacity and voltage regulation consider action using ACSR



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	2 nd	OVER HEAD SERVICE LINES: Components of service lines, service line (cables and conductors), bearer wire,
	3 rd	Lacing rod. Ariel fuse, service support, energy box and meters etc.
	4 th	Prepare and estimate for providing single phase supply of load of 5 KW (light, fan, socket) to a single stored residential building.
	5 th (Tutorial class)	Prepare and estimate for providing single phase supply load of 3KW to each floor of a double stored building having separate energy meter
10 th	1 st	Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire.
	2 nd	Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using bare conductor and insulated wire combined.
	3 rd	do
	4 th	ESTIMATING FOR DISTRIBUTION SUBSTATIONS: Introduction Pole mounted substation.
	5 th (Tutorial class)	Materials estimate for following types of transformer substations. Pole mounted substation
11 th	1 st	Materials estimate for following types of transformer substations. Plinth Mounted substation
	2 nd	Revision : chapter 1
	3 rd	Revision : chapter 2
	4 th	Revision : chapter 3
	5 th (Tutorial class)	Revision : chapter 4
12 th	1 st	Revision : chapter 5
	2 nd	Revision : chapter 6
	3 rd	Doubt clearing class
	4 th	Discuss of previous paper question and answers
	5 th (Tutorial class)	Discuss of previous paper question and answers

Signature of HOD (electrical)
15/3/22

Signature of faculty
10/3/22