GOVERNMENT POLYTECHNIC, PURI

DEPARTMENT OF ELECTRICAL ENGINEERING

Discipline: **ELECTRICAL ENGG**	Semester:6TH	Name of the Teaching Faculty: **MR NILAKANTHA NAIK, LECTURER IN ELECTRICAL ENGG.**
Subject: **ELECTRICAL INSTALLATION AND ESTIMATING**	No. of classes allotted per week : **05**	Semester From date: **16.01.2024** To Date: **26.04.2024** No. of weeks:14
PRE- REQUISITE	Knowledge of electrical drawing Specification of different wires, cables,accessories etc. Components used in Substations(HT,LT)	
COURSE OUTCOMES	On successful completion, a student will be able to: 1. Get acquainted with Indian Electricity Rules, Electric Installations. 2. Prepare and estimate of materials required for different wiring schemes (CTS wiring, conduit wiring, casing-capping) 3. Develop an understanding of Over-Head Installations and O.H Service Lines.4. Prepare material estimate of O.H installations and O.H service Lines with detailed specification and quantity of materials required. 5. Prepare material estimate for different sub-stations with detailed specifications of size & quantity of conductors and cables from electrical and mechanical considerations.	

Week	Class Day	Theory / Practical Topics	DELIVERY METHOD
1st	1st	Definitions, Ampere, Apparatus, Accessible, Bare, cable, circuit, circuit breaker, conductor voltage (low, medium, high, EH),	whiteboard
	2nd	live, dead, cut-out, conduit, system, danger, Installation, earthing system, span, volt, switch gear, etc.	whiteboard
	3rd	General safety precautions, rule 29, 30, 31, 32, 33, 34, 35, 36, 40, 41, 43, 44, 45, 46.	whiteboard
	4th	General conditions relating to supply and use of energy : rule 47, 48, 49, 50, 51, 54, 55, 56, 57, 58, 59.	whiteboard
	5th	General conditions relating to supply and use of energy : rule 60, 61, 62, 63, 64, 65, 66, 67, 68, 70.	whiteboard
2nd	1st	OH lines : Rule 74, 75, 76, 77, 78, 79, 80, 86, 87, 88, 89, 90, 91	whiteboard
	2nd	Electrical installations, domestics, industrial, Wiring System, Internal distribution of Electrical Energy.	PPT
	3rd	Methods of wiring, systems of wiring, wire and cable, conductor materials used in cables, insulating materials mechanical protection.	PPT
	4th	Types of cables used in internal wiring, multi-stranded cables, voltage grinding of cables, general specifications of cables.	PPT
	5th	ACCESSORIES: Main switch and distribution boards, conduits, conduit accessories and fittings, lighting accessories and fittings,	PPT
3rd	1st	fuses, important definitions, determination of size of fuse – wire, fuse units.	whiteboard
	2nd	Earthing conductor, earthing, IS specifications regarding earthing of electrical installations, points to be earthed.	whiteboard
	3rd	Determination of size of earth wire and earth plate for domestic and industrial installations. Material required for GI pipe earthing.	whiteboard
	4th	LIGHTING SCHEME: Aspects of good lighting services. Types of lighting schemes,	whiteboard
	5th	design of lighting schemes, factory lighting, public lighting installations, street lighting,	whiteboard
4th	1st	general rules for wiring,	whiteboard
	2nd	determination of number of points (light, fan, socket, outlets),	whiteboard
	3rd	determination of total load, determination of Number of sub-circuits.	whiteboard
	4th	**Class Test**	Online/Offline
	5th	Type of internal wiring, cleat wiring, CTS wiring, wooden casing capping, metal sheathed wiring,	PPT
5th	1st	CTS wiring, wooden casing capping, metal sheathed wiring,	PPT
	2nd	conduit wiring, their advantage and disadvantages comparison and applications.	PPT
	3rd	Prepare one estimate of materials required for CTS wiring for small domestic installation of one room and one verandah within 25 m2 with given light, fan & plug points.	whiteboard
	4th	Prepare one estimate of materials required for CTS wiring for small domestic installation of one room and one verandah within 25 m2 with given light, fan & plug points.	whiteboard
	5th	Prepare one estimate of materials required for conduit wiring for small domestic installation of one room and one verandha within 25 m2 with given light, fan & plug points.	whiteboard
	1st	Prepare one estimate of materials required for conduit wiring for small domestic installation of one room and one verandha within 25 m2 with given light, fan & plug points.	whiteboard
	2nd	Prepare one estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen & verandah within 80m2 with given light, fan & plug points.	whiteboard

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6th	3rd	Prepare one estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen & verandah within 80m2 with given light, fan & plug points.	whiteboard
	4th	Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m2 and load within 10 KW.	whiteboard
	5th	Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m2 and load within 10 KW.	whiteboard
7th	1st	**Assignment & class test**	Online/Offline
	2nd	Main components of overhead lines, line supports, factors Governing Height of pole,	ppt
	3rd	conductor materials, determination of size of conductor for overhead transmission line,	ppt
	4th	line, cross arms, pole brackets and clamps, guys and stays, conductors configurations,	ppt
	5th	spacing and clearances, span lengths, overhead line insulators, types of insulators,	whiteboard
8th	1st	lighting arresters, danger plates, anti-climbing devices, bird guards, beads of jumpers, jumpers, tee-offs, guarding of overhead lines.	whiteboard
	2nd	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.	whiteboard
	3rd	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.	whiteboard
	4th	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.	whiteboard
	5th	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 (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.	whiteboard
9th	1st	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 (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.	whiteboard
	2nd	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 (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.	whiteboard
	3rd	**Assignment & class test**	Online/Offline
	4th	Components of service lines, service line (cables and conductors),	ppt
	5th	bearer wire, lacing rod. Ariel fuse, service support, energy box and meters etc.	ppt
10th	1st	Prepare and estimate for providing single phase supply of load of 5 KW (light, fan, socket) to a single stored residential building.	whiteboard
	2nd	Prepare and estimate for providing single phase supply of load of 5 KW (light, fan, socket) to a single stored residential building.	whiteboard
	3rd	Prepare and estimate for providing single phase supply load of 3KW to each floor of a double stored building having separate energy meter.	whiteboard
	4th	Prepare and estimate for providing single phase supply load of 3KW to each floor of a double stored building having separate energy meter.	whiteboard
	5th	Prepare and estimate for providing single phase supply load of 3KW to each floor of a double stored building having separate energy meter.	whiteboard
11th	1st	Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire.	whiteboard
	2nd	Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire.	whiteboard
	3rd	Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire.	whiteboard
	4th	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.	whiteboard
	5th	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.	whiteboard
12th	1st	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.	whiteboard
	2nd	**Assignment & class test**	Online/Offline
	3rd	Prepare one materials estimate for following types of transformer Pole mounted substation	ppt
	4th	Prepare one materials estimate for following types of transformer Pole mounted substation	ppt
	5th	Prepare one materials estimate for following types of transformer Pole mounted substation	ppt
13th	1st	Prepare one materials estimate for following types of transformer Plinth Mounted substations	whiteboard
	2nd	Prepare one materials estimate for following types of transformer Plinth Mounted substations	whiteboard
	3rd	Prepare one materials estimate for following types of transformer Plinth Mounted substations	whiteboard
	4th	**Assignment & class test**	Online/Offline

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	5th	Assignment & class test	Online/Offline
14th	1st	Revision & Previous Year Question Discussion	Online/Offline
	2nd	Revision & Previous Year Question Discussion	Online/Offline
	3rd	Revision & Previous Year Question Discussion	Online/Offline
	4th	Revision & Previous Year Question Discussion	Online/Offline
	5th	Revision & Previous Year Question Discussion	Online/Offline

LEARNING RESOUCES:

01. Electrical Installation and Estimating,Surjit Singh,Dhanpatrai and sons
02.A course in Electrical Installation, Estimating and costing J. B. Gupta, S.K.Kataria and Sons
03.Electrical Estimating and Costing , N. Alagappan S.Ekambaram,TATA McGRAW HILL

10/07/24

Sign. of HOD

Sign. of Faculty concerned

10.6.24

Principal
G.P Puri

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