LESSON PLAN FORE LECTRICAL INSTALLATION AND ESTIMATING

Discipline: Electrical Engineering	**Semester: 6th**	**Name of the Teaching Faculty: Subhra Pratik Sahoo (PTGF)**
Subject: ELECTRICAL INSTALLATION AND ESTIMATING	**No.of days per week class allotted: 5**	**Semester From Date : 14/02/2023 to Date :25/05/2023** **No. of Weeks: 15**
Week	**Class Day**	**Theory**
1st		**1. INDIAN ELECTRICITY RULES**
	1st	1.1Definitions,Ampere,Apparatus,Accessible, Bare, cable, circuit, circuit breaker
	2nd	1.1conductorvoltage (low, medium ,high, EH),live, dead, cut-out, Conduit system, danger, Installation, Earthing system, span, volt, switch gear, etc.
	3rd	1.2Generalsafetyprecautions,rule 29, 30, 31,32, 33, 34,35, 36, 40, 41,43, 44, 45,46
	4th	1.3 General conditions relating to supply and use of energy :rule 47, 48, 49,50, 51,54, 55, 56
	5th	Tutorial class
2nd	1st	1.3 General conditions relating to supply and use of energy :rule 57, 58,59, 60, 61,62,63, 64, 65, 66,67, 68, 70
	2nd	1.4OH lines :Rule 74, 75, 76,77, 78, 79,80, 86, 87, 88,89, 90, 91
		2. ELECTRICAL INSTALLATIONS
	3rd	2.1 Electrical installations, domestics, industrial, Wiring System, Internal distribution of electrical energy
	4th	2.1Methods of wiring, systems of wiring, wire and cable, conductor materials used in cables
	5th	Tutorial class
3rd	1st	2.1insulating materials mechanical protection. Types of cables used in internal wiring
	2nd	2.1multi-stranded cables, voltage grinding of cables, general specifications of cables.
	3rd	2.2 ACCESSORIES: Main switch and distribution boards, conduits, conduit accessories and fittings
	4th	2.2lighting accessories and fittings, fuses, important definitions, determination of size of fuse – wire, fuse units.
	5th	Tutorial class
4th	1st	2.2Earthing conductor, Earthing , IS specifications regarding earthing of electrical installations, points to be earthed.
	2nd	2.2Determination of size of earthwire and earth plate for domestic and Industrial installations. Material required for GI pipe earthing.
	3rd	2.3 LIGHTING SCHEME: Aspects of good lighting services. Types of lighting schemes
	4th	2.3design of lighting schemes ,factory lighting, public lighting installations
	5th	Tutorial class
5th	1st	2.3streetlighting, general rules for wiring,

	2nd	2.3determination of number of points(light, fan, socket, outlets),determination of total load, determination of Number of subcircuits.
		3. INTERNAL WIRING
	3rd	3 .1Typeof internal wiring, cleatwiring , CTS wiring , their advantage and disadvantages comparison and applications
	4th	3 .1wooden casing capping , metal sheathed wiring, conduit wiring,their advantage and disadvantages comparison and applications
	5th	Tutorial class
	1st	3 .2Prepareone estimate of materials required for CTS wiring for small domestic installation of one room and one verandah within 25 m2 with given light, fan & plugpoints.
6th	2nd	3.2Prepare 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 & plugpoints.
	3rd	3 .3Prepareone estimate of materials required for conduitwiring for small domestic installation of one room and one verandha within 25 m2 with given light, fan& plugpoints.
	4th	3 .3Prepareone estimate of materials required for conduitwiring for small domestic installation of one room and one verandha within 25 m2 with given light,fan & plugpoints.
	5th	Tutorial class
7th	1st	3 .4Prepare one estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen &verandah within80m2with given light ,fan &plug points.
	2nd	3 .4 Prepare one estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen &verandah within80m2with given light, fan &plug points.
	3rd	3 .4Prepareone estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen &verandah within80m2with given light, fan &plug points.
	4th	3 .5Prepare one estimate of materials required for erection of conductwiring to a smallworkshop installation about30m2 and loadwithin 10 KW.
	5th	*Tutorialclass*
8th	1st	3 .5Prepare one estimate of materials required for erection of conductwiring to a smallworkshop installation about 30m2 andloadwithin 10 KW.
	2nd	3 .5 Prepare one estimate of materials required for erection of conductwiring to a smallworkshop installation about 30m2 andloadwithin 10 KW.
		4. OVER HEAD INSTALLATION
	3rd	Maincomponentsofoverhead lines,linesupports,
	4th	factors Governing Height ofpole, conductormaterials,determination of size ofconductor for overheadtransmission line
	5th	Tutorial class
9th	1st	cross arms, polebrackets andclamps, guys and stays, conductors configurations
	2nd	spacing and clearances, span lengths, overhead lineinsulators, types of insulators
	3rd	lighting arresters, danger plates, anti-climbing devices, birdguards, beadsof jumpers, Jumpers, tee-offs, guarding of overheadlines.

	4th	4.2.Prepare an estimate of materials required for LTdistribution line withinloadof100KW maximum and standard spans involving calculation of the size of conductor(from conductor chart),current carrying capacity and voltage regulation consideration using ACSR.
	5th	Tutorial class
10th	1st	4.2.Prepare an estimate of materials required for LT distribution line withinloadof100KW maximum and standard spans involving calculation of the size of conductor(from conductor chart), current carrying capacity and voltage regulation consideration using ACSR.
	2nd	4.3. Prepare an estimate of materials required for LT distribution line withinloadof100KW maximum and standard spans involving calculation of the size of conductor(from conductor chart), current carrying capacity and voltage regulation consideration using ACSR.
	3rd	4.3. Prepare an estimate of materials required for LT distribution line withinloadof100KW maximum and standard spans involving calculation of the size of conductor(from conductor chart), current carrying capacity and voltage regulation consideration using ACSR.
	4th	4.4.Prepare an estimate of materials required for HT distribution line(11KV) within2kmandloadof 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.
	5th	Tutorial class
11th	1st	*4.4.Preparean estimate of materials required for HT distribution line (11KV) within 2km 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.*
	2nd	*Preparean estimate of materials required for HT distribution line (11KV) within 2km 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.*
	3rd	*Prepare an estimate of materials required for HT distribution line (11KV) within 2km 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.*
		5. OVER HEAD SERVICELINES
	4th	5.1 Components of service lines, service eline (cables and conductors), bearerwire, lacing rod. Ariel fuse, service support, energy box and meters
	5th	Tutorial class
12th	1st	5.2 Prepare and estimate for providing single phase supply of loadof5KW(light ,fan, socket) to a single stored residential
	2nd	5.2 Prepare and estimate for providing single phase supply of loadof5 KW(light, fan, socket) to a single stored residential building.
	3rd	5.3 Prepare and estimate for providing single phase supply loadof3KW to each floor of a double stored building having separate energy meter.
	4th	5.3 Prepare and estimate for providing single phase supply loadof3KW to each floor of a double stored building having separate energy meter.

	5th	Tutorial class
13th	1st	5.3 Prepare and estimate for providing single phase supply loadof3KW to each floor of a double stored building having separate energy meter.
	2nd	5.4 Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire
	3rd	5.4 Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire
	4th	5.4 Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire
	5th	Tutorial class
14th	1st	*5.5 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.*
	2nd	5.5 *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.*
	3rd	5.5 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.
		6. ESTIMATING FOR DISTRIBUTIONSUBSTATIONS
	4th	6.1 Prepare one materials estimate for following types of transformer substations. 6.1.1 Pole mounted substation
	5th	Tutorial class
15th	1st	*6.1 Prepare one materials estimate for following types of transformer substations.* *6.1.1Polemounted substation.*
	2nd	6.1 Prepare one materials estimate for following types of transformer substations. 6.1.1 Pole mounted substation.
	3rd	6.1 Prepare one materials estimate for following types of transformer substations. 6.1.2Plinth Mounted substation.
	4th	6.1 Prepare one materials estimate for following types of transformersubstations. 6.1.2Plinth Mounted substation.
	5th	*6.1 Prepare one materials estimate for following types of transformer substations.* *6.1.2Plinth Mounted substation.*

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