LESSON PLAN FOR ELECTRICAL INSTALLATION AND ESTIMATING

Discipline: Electrical Engineering	Semester: 6th	Name of the Teaching Faculty: Er.Nrusingha charana Behera (Sr.Lect.) Dept. of Electrical Engineering
Subject: ELECTRICAL INSTALLATION AND ESTIMATING	No. of days per week class allotted: 5	Semester From Date : ...14.2.2023... to Date: ...23.....5. 2023 No. of Weeks: 15
Week	**Class Day**	**Theory**
1st		**1. INDIAN ELECTRICITY RULES**
	1st	1.1 Definitions, Ampere, Apparatus, Accessible, Bare, cable, circuit, circuit breaker
	2nd	1.1 conductor voltage (low, medium, high, EH), live, dead, cut-out, conduit, system, danger, Installation, earthing system, span, volt, switch gear, etc.
	3rd	1.2 General safety precautions, 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	1.4 OH 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	2.1 Methods 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	2.1 multi-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 tobe earthed.
	2nd	2.2Determination of size of earth wire 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	2.3 design of lighting schemes, factory lighting, public lighting installations,
	5th	Tutorial class
5th	1st	2.3 street lighting, 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 . 1 Type of internal wiring, cleat wiring, CTS wiring, their advantage and disadvantages comparisonand applications
	4th	3 . 1 wooden casing capping, metalsheathed wiring, conduit wiring, their advantage and disadvantages comparisonand applications
	5th	Tutorial class
	1st	3 . 2 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.
6th	2nd	3 . 2 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.
	3rd	3 . 3 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.
	4th	3 . 3 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.
	5th	Tutorial class
7th	1st	3 . 4 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.
	2nd	3 . 4 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.

	3rd	3 . 4 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.
	4th	3 . 5 Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m2 and load within 10 KW.
	5th	*Tutorial class*
8th	1st	3 . 5 Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m2 and load within 10 KW.
	2nd	3 . 5 Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m2 and load within 10 KW.
		4. OVER HEAD INSTALLATION
	3rd	Main components of overhead lines, line supports,
	4th	factors Governing Height ofpole, conductor materials, determination of size of conductor for overheadtransmission line,
	5th	Tutorial class
9th	1st	cross arms, pole brackets and clamps, guys and stays, conductors configurations,
	2nd	spacing and clearances, span lengths, overhead line insulators, types of insulators,
	3rd	lighting arresters, danger plates, anti-climbing devices, bird guards, beads of jumpers, jumpers, tee-offs, guarding of overhead lines.
	4th	4.2.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.
	5th	Tutorial class
10th	1st	4.2.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.
	2nd	4.3.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.

	3rd	4.3.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.
	4th	4.4.Prepare an estimate of materials required for HT distribution line (11 KV) 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.
	5th	Tutorial class
11th	1st	*4.4.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.*
	2nd	4.4.Prepare an estimate of materials required for HT distribution line (11 KV) 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	4.4.Prepare an estimate of materials required for HT distribution line (11 KV) 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 SERVICE LINES
	4th	5. 1 Components of service lines, service line (cables and conductors), bearer wire, lacing rod. Ariel fuse, service support, energy box and meters etc.
	5th	Tutorial class
12th	1st	5. 2 Prepare and estimate for providing single phase supply of load of 5KW(light,fan,socket) to a single stored residential building.
	2nd	5. 2 Prepare and estimate for providing single phase supply of load of 5 KW (light, fan,socket) to a single stored residential building.

	3rd	5. 3 Prepare and estimate for providing single phase supply load of 3KW to each floorof a double stored building having separate energy meter.
	4th	5. 3 Prepare and estimate for providing single phase supply load of 3KW 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 load of 3KW 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 DISTRIBUTION SUBSTATIONS
	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.* *6.1.1 Pole mounted 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. 6.1.2 Plinth Mounted substation.
	4th	6. 1 Prepare one materials estimate for following types of transformer substations. 6.1.2 Plinth Mounted substation.

	5th	*6. 1 Prepare one materials estimate for following types of transformer substations.* *6.1.2 Plinth Mounted substation.*

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(NRUSINGH CHARAN BEHERA)

Sr. lecturer Electrical.

GP. Jajpur, Rugadi