



Lok Jagruti Kendra University
University with a Difference

Diploma in Electrical Engineering



Course Code: 025070502
**Electrical Wiring,
Estimating & Costing**

Programme / Branch Name			Diploma in Electrical Engineering			
Course Name	Electrical Wiring, Estimating & Costing				Course Code	025070502
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses

ESC: Engineering Science Courses

OEC: Open Elective Courses

BSC: Basic Science Courses

PCC: Program Core Courses

PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week / Credits				Evaluation Scheme			
L	T	P	Total Credit	CCE	SEE (Th)	SEE (Pr)	Total Marks
4	0	2	5	50	50	50	150

Legends: L: Lectures T: Tutorial P: Practical

CCE: Continuous & Comprehensive Evaluation

SEE (Th): Semester End Evaluation (Theory)

SEE (Pr): Semester End Evaluation (Practical)

2. Prerequisite

- ✓ Knowledge about Fundamentals of Electrical and Electronics Engineering.
- ✓ Electrical Circuits.
- ✓ Electrical Power Transmission and Distribution.

3. Rationale

Electrical wiring plays a major role in distributing the electrical energy from electric utilities to consumer. Electrical diploma holders have to work as Technicians and Supervisors for planning, installing and testing various electrical wiring Installations such as residential, commercial and Industrial electrification schemes. They should be able to prepare costing and estimates for these schemes with a thorough understanding of the methods/procedure of estimating, tendering/ contracting is desired. Knowledge of IE rules for different types of electrical Installation, their planning considerations equips the students with the capability to plan and prepare different Installation projects. Essential efforts are made in this course to develop above skills in the students.

4. Objectives

The course content should be taught and with the aim to develop different types of skills so that students are able to acquire following competency:

- ✓ Understand and interpret the different electrical symbols and wiring diagrams.
- ✓ Estimate and determine the cost of domestic and Industrial wiring installation.
- ✓ Prepare a tender document for a particular job.
- ✓ Estimate the material required for HT and LT lines as well as underground system.
- ✓ Understand the importance of Electrical Safety.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcome	% Weightage	Hours
1	Elements of Electrical Wiring	1.1. Introduction about Electrical Wiring 1.2. Types of Wires. 1.3. Types of Wiring 1.4. Types Wiring System. 1.5. Comparison of Different Wiring Systems. 1.6. Specifications of Electrical Wiring Materials and Accessories 1.7. Tools Used for Wiring 1.8. Types of Wiring Connections 1.9. Electrical Wiring Diagrams 1.10. Various Lighting Circuits. 1.11. Service Mains and Meter Board Connections. 1.12. Testing of Wiring Installations.	<ul style="list-style-type: none"> Types of Wires, Wiring and Wiring System Tools Used for Wiring Wiring Diagrams and Various Lighting Circuits Testing of Wiring 	20	12
2	Electrical Estimating, Costing and Contracting	2.1 Estimation 2.2 Costing and Total Cost 2.3 Special Charges for Estimation. 2.4 Purchase Procedure. 2.5 Contracting. 2.6 Tender. 2.7 Procedure for Passing the Tender. 2.8 Importance of Security Deposit.	<ul style="list-style-type: none"> Estimation and Costing Purchase Procedure Contract, Tender and Tender Procedure 	20	10
3	Estimation and Costing of Domestic and Industrial Wiring	3.1 Introduction about Domestic Wiring. 3.2 Procedure for Domestic Wiring Estimation. 3.3 Introduction about Industrial Wiring. 3.4 Procedure for Industrial Wiring Estimation. 3.5 Modern Trends in Electrical Wiring. 3.6 I.E. Rules for Domestic and Industrial Wiring.	<ul style="list-style-type: none"> Domestic Wiring and Procedure of it. Industrial Wiring and Procedure of it. IE Rules for Domestic and Industrial Wiring 	20	12
4	Estimation of Overhead	4.1 Overview about OHT System.	<ul style="list-style-type: none"> Estimation and Costing of Overhead 	25	12

	Transmission and Underground Distribution System	4.2 Estimation and Costing of OHT Line. 4.3 IE Rules Pertaining to L.V. Transmission Line. 4.4 Meaning of Service Connection and its Types. 4.5 Methods of Installation of Service Connection 1-Ø and 3-Ø 4.6 Overhead Distribution System and its Components. 4.7 Estimation and Costing of Overhead Distribution System. 4.8 IE Rules Pertaining to Overhead Lines Transmission and Distribution Connection and Service Connections 4.9 Underground Distribution System and its Diagram. 4.10 Methods of Providing Underground Service Connection. 4.11 Estimation and Costing of Underground Distribution System.	Transmission Line. • Methods of Installation of Service Connection. • Estimation and Costing of Overhead Distribution System. • Estimation and Costing of Underground Distribution System.		
5	Electrical Safety and IE Rules of Safety.	5.1 Importance and Advantages of Safety Rules. 5.2 Safety Precautions in Electrical Installation. 5.3 Fire Alarm System 5.4 Smoke Detector System 5.5 Earthing System 5.6 Lightning Arresters 5.7 MCB and ELCB as Safety Equipments. 5.8 Use of DG Set as Stand by Power Supply. 5.9 IE Rules Related to Electrical Installation and Testing.	• Importance and Advantages of Safety Rules. • Fire Alarm, Smoke Detector and Earthing System. • Lightning Arrester, MCB and ELCB. • IE Rules for Electrical Installation and Testing.	15	10

**Total
Hours**
56

6. List of Practical's / Exercises

The practical/exercises should be properly designed and implemented in an attempt to develop different types of skills that students can acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

Sr. No	Practical / Exercises	Key Competency	Hours
1	Demonstration and study about different types of Wiring System.	Wiring System.	2
2	Demonstration and study about Tools used for Electrical Wiring.	Tools Used in Wiring.	2
3	Demonstration and study about various Lightening Circuits.	Lightening Circuits.	2
4	To study about Contract and different types of Purchase Procedure.	Contract and Purchase Procedure	2
5	To study about Tender and Procedure of it.	Tender	2
6	To study about Estimation and Costing of Domestic Wiring Installation.	Domestic Wiring.	2
7	To study about Estimation and Costing of Industrial Wiring Installation.	Industrial Wiring.	2
8	To study about Estimation and Costing of Overhead Transmission Line.	Overhead Transmission Line.	2
9	To study about Estimation and Costing of Overhead Distribution Line.	Overhead Distribution Line.	2
10	To study about Estimation and Costing of Underground Distribution System.	Underground Distribution System.	2
11	To study about Fire Alarm, Smoke Detector and Earthing System.	Sub-station.	2
12	To study about Underground Cables.	Underground Cables.	2

7. Suggested Specification Table for Evaluation Scheme

Unit No.	Unit Name	Teaching Hours	Distribution of Topics According to Bloom's Taxonomy					
			R %	U %	App %	C %	E %	An %
1	Elements of Electrical Wiring	12	30	20	30	5	5	10
2	Electrical Estimating, Costing and Contracting	10	30	30	10	10	10	10
3	Estimation and Costing of Domestic and Industrial Wiring	12	30	30	10	10	10	10
4	Estimation of Overhead Transmission and Underground Distribution System	12	20	30	20	5	5	20
5	Electrical Safety and IE Rules of Safety	10	40	20	10	10	10	10

Legends: R - Remembering
U - Understanding

App – Applying
C – Creating

E- Evaluating
An- Analyzing

8. Textbooks

- 1) Electrical Power Generation, Transmission and Distribution by S.N. Singh, PHI Learning, Latest Edition
- 2) Principles Power System by V. K. Mehta and Rohit Mehta, S. Chand and Company Ltd., Latest Edition

9. Reference Books

- 1) Electrical Design Estimating and Costing. K.B. Raina & K. Battacharya. Khanna Publications.
- 2) Electrical Installation Estimating and Costing. J.B. Gupta S.K. Kataria and Sons
- 3) Electrical Wiring, Estimating and Costing. Dr.S.L.Uppal New age international limited
- 4) Electrical Estimating and costing. Surjit Singh Dhanpat Rai company.
- 5) Electrical Estimating and Costing. N. Alagappan and Ekambaram Tata McGraw Hill
- 6) Electrical wiring, Estimating and costing B.D. Arora R.B. Publication.
- 7) Electrical Estimating Specification and Costing M. Raghunath Rao Eastern Book Promoters Belgaum (EBPB)

10. Open Sources (Website, Video, Movie)

- 1) <https://www.electrical4u.com/>
- 2) [https://www.nptelvideos.in/electrical power](https://www.nptelvideos.in/electrical%20power)
- 3) https://en.wikipedia.org/wiki/Electric_power_transmission
- 4) <https://www.powergridindia.com/>