GOVERNMENT OF TAMILNADU

DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25

STATE PROJECT COORDINATION UNIT

(Established under Canada India Institutional Cooperation Project)

CURRICULUM

Course Name	**ELECTRICAL DESIGN FOR MEP WORKS**
Course Code	**EE/2020/018**
Course Duration	80 Hours
Minimum Eligibility Criteria	10th/+2 /ITI/Diploma/Graduate
Pre-requisites (if any)	Knowledge of Electrical Wiring & Estimation
Course Objectives	Training module has been designed for the participants to • Understand the functions of Electrical Equipments. • Understand the principle and design of Lighting System. • Learn the Electrical load calculation methods • Practice in selection of Cable for Electrical Installation.
Course Outcomes	At the end of training, the trainees will be able to • Explain the functions of Electrical Installation and Equipments • Perform Electrical Lighting system Design. • Perform Electrical load calculation for design aspect. • Select the size of cable for electrical installations.
Expected Job Roles	Electrical Designer for MEP Works

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
EE/2020/018	ELECTRICAL DESIGN FOR MEP WORKS	Theory	32	10	20	3 Hours
		Practical	48	40	80	
		Total	80	50	100	

EE/2020/018– ELECTRICAL DESIGN FOR MEP WORKS

DETAILED SYLLABUS

Unit No	Modules	No.of.Hours	
		Theory	Practical
I	**Electrical Basis and Electrical Accessories**	**15 Hours**	
1.1	Introduction to Electrical, Electrical Basics	10	05
1.2	Electricity-Generation, Transmission & Distribution		
1.3	Electrical Equipment's-Transformer, Motor, Generator, UPS etc.		
1.4	Codes & Standards – NBC, BS, NEC, DEWA.		
1.5	Switches-one way, 2 way, 3 way, etc		
1.6	Measuring Instruments		
1.7	Sockets or Receptacle - Ring circuit		
1.8	Wiring connections in residential & commercial projects		
1.9	Panel wiring connections		
II	**Lighting System**	**15 Hours**	
2.1	Introduction - Types of Light Fixtures	05	10
2.2	LUX or Foot Candle measurement - LUX Level as per Project		
2.3	Light Fixtures calculation as per Standards		
2.4	Standard method of lighting placement in project		
2.5	Preparation of Light fixture schedule		
2.6	Light Fixture Selection Software's – CG-LUX, DIALUX & DIALUX EVO.		
III	**Load Calculation & Distribution**	**20 Hours**	
3.1	Light Fixtures load calculation - Fan load calculation - HVAC load calculation	10	10
3.2	Plumbing & Fire Fighting load calculation		
3.3	Lift load calculation as per project requirement		
3.4	Preparation of load schedule		
3.5	Maximum Demand Load - Total load calculation - Diversity Factor & its Standards		
3.6	Load distribution of Lighting & power		
3.7	Load distribution schedule – HVAC, Fire Fighting, common Loads, MDB, SMDB & FDB		
3.8	Load distribution schedule of Emergency devices- DG & UPS.		

IV	Cables Section & Installation	15 Hours	
4.1	Cables- armoured& un armoured cables - Cable Insulation Cable type & construction features	10	05
4.2	Cable selection - Cable Routing - Current rating of cables		
4.3	Cable size calculation for motors - Voltage drop Calculation of Cables - Application of cable gland & types - Cable schedule Preparation		
4.4	Cable resistance & impedance values - Cable Lug & its Applications - Calculation of short circuit withstand capacity of cables		
4.5	Installation of cables - Conduits – types & application - Conduit selection Installation method of conduits		
4.6	Cable trays-types, installation procedure, different sizes of cable trays - Fittings & Accessories of Cable tray - Cable tray sizing calculation - Cable tray Routing		
V	**Electrical Equipments & Section**	**15 Hours**	
5.1	Transformer & its Application - Types of Transformers	05	10
5.2	Transformer sizing calculation based on project load - Installation standards of Transformer		
5.3	Generator & its Application - Types of Generators - Generator sizing calculation - Wiring connections of Generator		
5.4	UPS & its application - Types of UPS - UPS designing for emergency loads - Wiring connections of UPS		
5.5	Battery Sizing calculation - Capacitor bank function		
	Total Theory and Practical Hours	**40**	**40**
	Total hours	80	

HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1	PC/Laptop

SOFTWARE REQUIREMENT

S.NO	LIST OF SOFTWARE
1	CG-LUX, DIALUX & DIALUX EVO

REFERENCE BOOKS

S.NO	NAME OF THE BOOK	AUTHOR	PUBLISHER
1	Practical Guides to Testing and Commissioning of Mechanical, Electrical and Plumbing	Chandra B. Gurung	Partridge Publishing Singapore
2	Building Technology: Mechanical and Electrical Systems	Benjamin Stein	Wiley

ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the CIICP Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the CIICP Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training, Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

END EXAMINATION

ALLOCATION OF MARKS

S.NO	Description	Max. Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Objective and Wiring Diagram / Design	20
	b)Procedure and Calculation/ Execution	20
	c)Result and Viva	20
	d) Record	20
	Total Marks	**100**

THEORY MODEL QUESTION PAPER

EE/2020/018 ELECTRICAL DESIGN FOR MEP WORK

(Maximum Marks: 20)

(N.B: Answer any Twenty questions) **20x1= 20 Marks**

1. Expand BS?
2. Expand NEC?
3. What is meant by radial circuit?
4. What are the advantages of Ring main circuit?
5. What is meant by Lux?
6. What is the use of DIALux Software?
7. What is the use of CG-Lux Software?
8. What is meant by load balancing in wiring circuit?
9. Define Demand Factor.
10. Define Diversity Factor.
11. What is meant by Total Connected Load?
12. What are the advantages of Load scheduling?
13. What is the function of Distribution Board?
14. What is the necessity of calculating Maximum Demand Load?
15. What are the types of Cable Tray?
16. What is the use of Cable Lug?
17. What are the factors to be considered while selection of cable size?
18. What are the advantages of Armoured UG Cable?
19. Expand XLPE.
20. Expand MCC
21. What is meant by Method statement in MEP works?
22. What is meant by SMDB?
23. State True or False. Separate conduits and runways must be used for Lighting system and Fire Alarm System.
24. Expand UPS.
25. What is meant by Dry-type transformer?