CURRICULUM

FOR THE TRADE OF

Draftsman (Electrical)

UNDER

APPRENTICESHIP TRAINING SCHEME

सत्यमेव जयते

GOVERNMENT OF INDIA

MINISTRY OF SKILL DEVELOPMENT AND ENTREPRENEURSHIP

DIRECTORATE GENERAL OF TRAINING

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1. BACKGROUND

1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate (ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry**.** There are five categories of apprentices namely**; trade apprentice, optional trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of trade apprentices and optional trade apprentices vary from trade to trade. The apprenticeship training consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger

proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

1.3 **Reformation**

The Apprentices Act, 1961 has been amended and brought into effect from 22nd December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.
- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly.

2. RATIONALE

(Need for Apprenticeship in Draftsman - Electrical)

1. The greater degree of relevance of the training to familiar with basic drafting terminology and developing multi-view electrical wiring and drawings.

2. Acquiring effort to ensure that the work is done in trade drawing, that the trainees are prepared for the industrial drawing office.

3. It will enhance the ability to introduce the trainees to the current Industrial techniques.

4. It will help to use of symbols/codes and analyse electrical drawing for the various processes

5. Exposure to go through standard specifications and dimensional data required to complete drawing.

6. It will enhance the ability to work with modern drawing tools and equipment which are used by progressive industrial establishment.

7. It provides exposure to observe the components physically and measuring to produce working drawing from the dimensions taken.

8. It will enhance the ability to practice the aspiring draftsman with solving problems in wiring process.

9. Acquiring opportunity to design and draw assembled or sub-assembled component that can be a part of their professional portfolio.

3. JOB ROLES:

Brief description of job roles:

Draftsman Electrical-

The individual understands the concept of SLD, Electrical layout drawings such as cable, earthing, lighting & Lightning protection layouts for substations, control room, process area, off sites and utilities and Sub station Equipment Layouts.

Electrical Draftsman prepares various electrical drawings based on inputs received from engineers, architects etc.

4. GENERAL INFORMATION

1.	Name of the Trade	:	**Draftsman (Electrical)**
2.	Duration of Apprenticeship Training	:	**12 Months**
	(i) Basic Training	:	---
	(ii) Practical Training	:	12 Months
3.	Entry Qualification	:	ITI Electrical
4.	Selection of Apprentices	:	The apprentices will be selected as per the Apprentices Act amended time to time
5.	Trainer/Instructor Qualification	:	Engineering Graduates

5. COURSE STRUCTURE

Training duration details: -

Components of Training	Duration of Training in Months →											
↓	1	2	3	4	5	6	7	8	9	10	11	12
Practical Training												

5. BROAD SKILL COMPONENT TO BE COVERED DURING ON-JOB TRAINING

Name of the trade: Draftsman (Electrical)

Duration: 12 months

Duration : 12 months(52 weeks)	
Sl.No.	**Practical skills to be covered during on the job training**
1	Know the basic information about different department / activities of Electrical Department in the organization.
2	Learnprocesses engaged in Electrical Department

ANNEXURE – I

INFRASTRUCTURE FOR ON-JOB TRAINING

Trade: Draftsman (Electrical)

Actual training will depend on the existing facilities available in the company/establishments. However, the industry should ensure that the broad skills defined against On-Job Training part (i.e. 12 months) are imparted.

On the Job Training syllabus

1. Basics of **electricity generation technologies** including conventional & non-conventional ways of electricity generation. Knowledge of different factors e.g. load factor, demand factor, etc.

2. **Concept of impedance & admittance.** Different types of loads (R, RL, RC, RLC); their series & parallel connections along with phasor diagrams.

3. **Types of powers** i.e. Active, Reactive, Apparent & complex power.

4. Concept of **power factor**; effects of different types of loads on power factor.

5. **Types of supply & load connections**: Basics of single phase & three phase connections such as star & delta connections, voltage & current relations in balanced star & delta connected loads.

6. Working principles of **DC motors** (shunt, series, compound) & knowledge of their characteristics to understand their applications.

7. Working principles of **single phase & three phase AC motors**(induction, synchronuos, etc.) & knowledge of their characteristics to understand their applications.

8. Working principles of **transformers**, types of connections & respective applications.

9. Knowledge of **energy conservation** & simple techniques to achieve it.

10. Basic **operation principles of all household electrical appliances.**

11. Basic knowledge of **Power Quality** & effects of different types of loads on power quality.

12. Basic knowledge of **Solar PV energy generation systems**.

13. And last but not the least, **CONCEPT OF EARTHING/GROUNDING**