

CURRICULUM

FOR THE TRADE OF

**CCTV Camera Equipment Installation,
Service & Maintenance**

UNDER

APPRENTICESHIP TRAINING SCHEME

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT AND ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

1. **Category of trade** : Non-Engineering

 2. **Name of the Trade:**CCTV Camera Equipment Installation, Service & Maintenance

 3. **Duration of Apprenticeship Training** : **24 Months**
Break up of the Apprenticeship Training
 - (i) **Duration of Basic Training** : 6 (3+3) months / 1200 Hrs

 - (ii) **Duration of Practical Training/
On-the-job Training:** 18 (9+9) Months

 4. **Entry Qualification** : 10th Pass
 - (A) **Basic training components**
 - (i) Employability Skills – 110 Hrs
 - (ii) Basic numeracy - 50 Hrs
 - (iii) Trade theory - 120+120 Hrs
 - (iv) Trade practical - 400+400 Hrs
- (B) **Practical Training/On-the job training** : 18 Months

CONTENTS

Sl. No.	Topics	Page No.
1.	Acknowledgement	4
2.	Back Ground	5
3.	Rationale	7
4.	Job role	8
5.	Learning Outcomes	9
6.	General Information	11
7.	Course structure	12
8.	<p>Syllabus</p> <p>8.1 Basic Training – General Information</p> <p>8.1.1 Detail Syllabus of Core Skill</p> <p>8.1.2 Employability Skill – General information</p> <p>8.1.3 Syllabus of Employability Skill</p> <p>8.2 Basic Numeracy-General Information</p> <p>8.2.1 Syllabus of Basic Numeracy</p> <p>8.3 Practical Training – General Information</p> <p>8.3.1 Syllabus of Practical Training/ on-job training</p>	14
9.	Assessment Standard	35
10.	Further Learning Pathways	36
11.	Annexure – I Tools & Equipment’s for Basic Training and Infrastructure for On-Job Training	37
12.	Annexure – II Guidelines for Instructors & Paper setter	44

1. ACKNOWLEDGEMENT

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Special acknowledgement to the following departments in L&T Construction who have contributed valuable inputs in bringing out this curriculum through their expert members:

1. Competency Development Centre
2. Skills training institutes Facilities & Management Team
3. Principals and Master Trainers
4. Subject Matter Experts from respective department
5. VACUM (Vocational Curriculum) Development team of L&T Construction Skills Training Department

2. BACKGROUND

2. 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 four categories of apprentices namely; **tradeapprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices 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.

2. 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.

2. 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.

3. RATIONALE

[Need for Apprenticeship asConstructionworks]

In a construction industry, the identification and selection of most important construction trades, which covers almost 80% of the construction work activities. These trades cover Bar bending, Masonry, Formwork, Plumbing, Finishing-Tiling, Lab Technician, Surveyor, Electrician, Welding, CCTV, Optical Fibre Cable (OFC) and all sectorial activities. It will covers the Construction, Installation & Surveillance and Infrastructure industries.

The greater degree of relevance of the training with latest advancements of the industry will enhance the employability opportunities.

1. Understand the fundamental elements that make up a CCTV System.
2. Set up a Camera
3. Set up a Monitor
4. Set up Network devices
5. Set up Encoder and Decoders
6. Set up recording devices (NVR & DVR, VMS)
7. Set up Server and Storage
8. Set up UPS/DCPS
9. Set up Pole and foundation
10. Connect up and test system elements
11. Adjust the Back Focus of a lens to prevent picture going out of focus from day to night.
12. Setup For Wireless communication
13. Setup For Video Management Software
14. Perform Trouble shooting and maintenance
15. Perform Testing and Commissioning

4. JOB ROLE

Brief description of Job role:

Brief Job Description of CCTV Technician: A CCTV Technician performs specific duties and responsibilities, under supervision of supervisor or Team Lead for CCTV Installations & Operations, which consist of directing, coordinating, planning, designing, operating, installing, troubleshooting and routine maintenance of video surveillance cameras and systems connected with project specification / codal provision.

5. LEARNING OUTCOMES

A. GENERIC OUTCOME

- ❖ Recognize & comply safe working practices, environment regulation and housekeeping.
- ❖ Work in a team, understand and practice soft skills, technical English to communicate with required clarity.
- ❖ Understand and explain the concept in quality tools and labour welfare legislation and apply such in day to day work to improve productivity & quality.
- ❖ Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
- ❖ Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
- ❖ Understand and apply basic computer working, basic operating system and uses internet services to get accustomed & take benefit of IT developments in the industry.

B. SPECIFIC OUTCOME

The Trainees will be able to

- ❖ Understand the fundamental elements that make up a CCTV System.
- ❖ Set up a Camera
- ❖ Set up a Monitor
- ❖ Set up Network devices
- ❖ Set up Encoder and Decoders
- ❖ Set up recording devices (NVR & DVR, VMS)
- ❖ Set up Server and Storage
- ❖ Set up UPS/DCPS
- ❖ Set up Pole and foundation
- ❖ Connect up and test system elements
- ❖ Adjust the Back Focus of a lens to prevent picture going out of focus from day to night.
- ❖ Setup For Wireless communication

- ❖ Setup For Video Management Software
- ❖ Perform Trouble shooting and maintenance
- ❖ Perform Testing and Commissioning

6. GENERAL INFORMATION

1. Name of the Trade: CCTV Camera Equipment Installation, Service & Maintenance
2. Duration of Apprenticeship Training : 24 Months
Basic Training : 6 Months
Practical Training : 18 Months
3. Duration of Basic Training :
 - a. Block –I : 3 months
 - b. Block - II : 3 months
4. Total duration of Basic Training : 6 Months
5. Duration of Practical Training
(On -job Training) : 18 Months
6. Entry Qualification : 10thPass
7. Selection of Apprentices : The apprentices will be selected as per Apprenticeship Act amended time to time.
8. Rebate for ITI passed trainees : NA

Note: Industry may impart training as per above time schedule, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspect is compromised and duration of industry training to be remains as 1 year.

7. COURSE STRUCTURE

Training duration details:-

Time (in months)	1-3	4-12	13-15	16-24
Controlled Condition training	Part A	-----	Part B	-----
On-job training	-----	Part A	-----	Part B

Components of training	Duration of training in Months																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Controlled Condition Training Part A																									
On Job Training, Part A																									
Controlled Condition Training Part B (@ site)																									
On Job Training, Part B																									

8. SYLLABUS

8.1 BASIC TRAINING

(Part A & B)

DURATION: 06 MONTHS

GENERAL INFORMATION

- 1) Name of the Trade : CCTV Camera Equipment Installation, Service & Maintenance
- 2) Hours of Instruction : 800 Hrs.
- 3) Batch size : 20
- 4) Power Norms : NA
- 5) Space Norms : NA
- 6) Examination : The internal assessment will be held on completion of each Block.
- 7) Instructor Qualification :
 - a) Degree/Diploma in Engineering or Masters from recognized university/Board with one/two year post qualification experience respectively in the relevant field.
- 8) Tools, Equipment's & Machinery required: - As per Annexure – I

8.1.1 Details of Syllabus of Core Skill

COURSE CONTENTS:-

Introduction to Basic Competencies

- Introduction to Trade and duties of "CCTV Camera Equipment Installation, Service & Maintenance"
- Occupational health hazards, Personal Protective Equipments(PPE) usage
- Introduction, Handling, Storing and Maintenance of Tools, Materials, Consumables and Small Equipments
- CCTV Systems: – Introduction and uses.
- Elements of a basic CCTV system: - Camera, monitor and digital recorder.
- Camera types and uses: - Fixed dome & PTZ and Bullet, indoor and outdoor, monochrome, day and night.
- Camera specifications: - Sensitivity, signal to noise ratio and resolution.
- Back Focus adjustment .WDR
- Lens types: - Fixed and variable focal length, manual and motorized zoom, Use a lens calculator to choose correct lens for particular lens
- Scene illumination: - Lighting considerations, LED's, infrared lamp maintenance and bulb life.
- Network Devices- Switches, Routers, OLT and ONT, Types and applications, Configuration and termination
- Monitors and Multiple screen displays.
- Recording the footage: - Analogue and Digital video recorders. Backup and Archiving
- Video Management Software- Adding and Deleting camera, Recording mode, Fail Over, Logs, report, Monitoring ,Client
- Server- Installation, Configuration (Processor, Memory, Hardisk, Network Cars, Power supply, Graphics card, Mouthing)
- Time-lapse recording. Reviewing video footage.
- Cables and connectors: – Types (Fiber & Copper), uses, limitations, preparation and testing.
- Introduction to Digital CCTV and IP technology.
- Connection to other security systems.
- Use of test equipment including: – Multimeters, Oscilloscopes, Light Meters, OTDR/ Cable Length Meters, Lan Tester
- Relevant standards, issues and the "Operational Requirement".
- Power Supply- Types (UPS and DCPS), MCB, RCCB , Functionality and Termination
- Pole - Types of Pole and erection method
- Foundation – Types (Pre cast & in suite) erection method
- Junction survey – Types (Manual/ladder) method
- Wireless Communication- Types of Antenna, Radios, Limitation, Configuration
- Cable Termination-Cable Termination method, Procedure, Types Of Connectors, Cable Conduit, Cable Tray, Industrial Standard, laying Method
- Excavation – Open trancing and HDD, Back Filling , PCC
- Trouble Shooting and maintenance
- Enterprises Management System
- Fiber Optic – Splicing, Termination, Liu, Joint Enclosure
- Installation and Testing commissioning

Controlled Condition Training (Part A and Part B)

Duration: 6 Months (3 Month in each part)

Controlled Condition Training, Part A: 3 Months

Practical Competencies	Underpinning Knowledge (Theory)
CCTV Camera Installation	<ul style="list-style-type: none">• Understanding types of CCTV Camera• Understanding the site sketches & drawings• Network Cable laying• RJ45 Connector Crimping• Camera Mounting Assembly• Camera Mounting Marking• Mounting and Camera fixing• Power supply unit Connection• Network Cable Connection• Lens Adjustment• Safety• Site tidiness
CCTV Camera Configuration	<ul style="list-style-type: none">• Understanding the Configuration procedure• Create User Access• Assign IP Address• Assign Video Compression• Set Frame Rate• Set bandwidth• Set PTZ Preset• Set Time and Date, Time Zone• Set Recording mode• Set Privacy marking/Zone• Set OSD Name

Network Video Recorder Installation	<ul style="list-style-type: none"> • Understanding Installation Method • Interpretation of sketches & drawings • Network rack Installation • Hard disk Installation • Digital Video Recorder Mounting Assembly • Digital Video Recorder Mounting • Power Supply Adapter Connection • Network Cable connection
Network Video Recorder Configuration	<ul style="list-style-type: none"> • Understanding method of configuration • Create User Name and Password • Set Date and Time, Time Zone • Initialize hard Disk • Add Camera • Assign Recording type • Assign Frame Rate • Assign Video Compression • Set Bandwidth • Create Backup • Video Playback • Audio Integration

Network Switch Installation and Configuration	<ul style="list-style-type: none"> • Understanding Installation and Configuration method • Network Switch Assembly • Network Switch Installation • Connect Console cable • Create User name and Password • Date and Time configuration • Create Management IP Address • Enabling Telnet • Creating VLAN • Port Security • Poe enabling and Power Budget • Create Access List • Routing configuration • Multicast Enabling
CCTV Pole and Foundation Erection	<ul style="list-style-type: none"> • Understanding methods of Erection • Understanding the field requirement • Excavation and Backfilling method • PCC • Pre Cast Foundation erection • Pole and cantilever Assembly • Pole erection • Levelling and Alignment of pole • Cable routing • HDPE Laying • Manual and HDD Trenching • Man hole • Safety • Site Tidiness

Junction Box Installation	<ul style="list-style-type: none"> • Understanding methods of erection • Junction Box Mounting Assembly • Junction box Mounting • DCPS Fixing • Battery Termination • Network Switch Mounting • Cable laying and Routing • Power Cable Termination • Network Cable Termination • Liu Installation • Safety • Site Tidiness
UPS Installation	<ul style="list-style-type: none"> • Understanding types of UPS • Understanding methods of installation • Battery Assembly • Battery Inter connection • UPS Installion • Battery and Ups Interconnection • SNMP card Installation • UPS Configuration • Input and Output Voltage Selection • Frequency Selection • Bypass Selection • Parameters Checking • SNMP IP Address Setup • Safety Site Tidiness

Controlled Condition Training, Part B: 3 Months

PracticalCompetencies	UnderpinningKnowledge(Theory)
Firewall Installion and Configuration.	<ul style="list-style-type: none"> • Understanding Installation and Configuration method • Firewall Assembly • Firewall Installion • Connect Console Port • Create User name and Password • Set Up Management IP Address • Crete Device Name • Create user Group and Policy's • Enabling VPN • Set Up Wan IP • Routing Configuration
Monitor and Display Wall Installation and Configuration	<ul style="list-style-type: none"> • Understanding Installation and Configuration method • Display Unit Assembly • Display Mounting • Display Wall alignment • Power Supply Connection • Video Cable Connection • Set Up Video Parameters • Set Video Source • Mount Controller • Create User name and password • Set Up Input Source • Set Up Output Source • Configure Preset

Network Attached Storage Installation and Configuration	<ul style="list-style-type: none"> • Understanding Installation and Configuration method • Network Attached Storage Assembly • NAS Mounting • Hard Disk Mounting • Power Supply Connection • Network Cable Termination • Set User name and password • Set IP Address • Set device name • Raid configure • Create User Policy • Create Logical Unit No • Mount Volume Disk
Wireless Communication device Installation and configuration	<ul style="list-style-type: none"> • Understanding Installation and Configuration method • Assembly methods • Radio Assembly • Radio Installation • Radio Direction and Alignment (Line Of sight) • PoE Injector Connection • Network cable Termination • Set Up User name and Password • Set Up IP Address • Set Up Radio Name • Set Radio Bandwidth • Set Signal Strength • Create P2P Communication

<p>Server Installion and configuration</p>	<ul style="list-style-type: none"> • Understanding Installation and Configuration method • Assembly methods • Power supply Unit Assembly • Hard Disk Mounting • Ram fixing • Processor fixing • Power Cable Termination • Video cable Termination • Network cable Termination • Mouse and Keyboard Connection • Operating System Installation • Bios Setup • Date and Time Setup • Hard Disk configure • Software Installation • Trouble Shooting
<p>Cables and Termination</p>	<ul style="list-style-type: none"> • Understanding types of cables • Understanding types of connectors • Understanding methods of termination • Cable Sizing • Cable laying and routing • Cable Dressing • Raceways and Conduits • Connectors termination • Couplers and Connectors, Bend • Labeling and feruling • Electrical Safety

Passive Cabling	<ul style="list-style-type: none"> • Understanding the requirement • Laying of Fiber Cable • Laying of Cat6 Cable • Laying of Power Cable • LIU Termination • Fiber cable Splicing • Power cable termination • RJ45 Connector Crimping • Fiber Joint enclosure • Patch Panel • Cable manger • Safety Site Tidiness
Testing and commissioning Equipment	<ul style="list-style-type: none"> • Understanding the Equipment • Lan tester • Multi Meter • Electric Megger Meter • OTDR • Fiber Slicing machine • RJ45 Crimping Tool • Lug Punching Tool • Lux Level Meter • Flux Meter • Hand tools • Safety Site Tidiness

8.1.2 EMPLOYABILITY SKILLS

GENERAL INFORMATION

- 1) **Name of the subject** : **EMPLOYABILITY SKILLS**
- 2) **Applicability** : ATS- Mandatory for fresher only
- 3) **Hours of Instruction** : 110 Hrs.
- 4) **Examination** : The examination will be held at the end of two years Training by CSDCI.
- 5) **Instructor Qualification** :

i) MBA/BBA with two years experience or graduate in sociology/social welfare/Economics with two years experience and trained in Employability skill from DGET Institute.

And

Must have studied in English/Communication Skill and Basic Computer at 12th /diploma level

OR

ii) Existing Social Study Instructor duly trained in Employability Skill from DGET Institute.

8.1.3 SYLLABUS OF EMPLOYABILITY SKILLS

Part A

Basic Training

Topic No.	Topic	Duration (in hours)
	English Literacy	
1	Pronunciation : Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)	20
2	Functional Grammar Transformation of sentences, Voice change, Change of tense, Spellings.	
3	Reading Reading and understanding simple sentences about self, work and environment	
4	Writing Construction of simple sentences Writing simple English	
5	Speaking / Spoken English Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.	

I.T. Literacy		
1	<p>Basics of Computer</p> <p>Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.</p>	
2	<p>Computer Operating System</p> <p>Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.</p>	
3	<p>Word processing and Worksheet</p> <p>Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document.</p> <p>Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets</p>	20
4	<p>Computer Networking and INTERNET</p> <p>Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication.</p> <p>Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.</p>	

	Communication Skill	
1	<p>Introduction to Communication Skills</p> <p>Communication and its importance</p> <p>Principles of Effective communication</p> <p>Types of communication - verbal, non verbal, written, email, talking on phone.</p> <p>Non verbal communication -characteristics, components-Para-language</p> <p>Body - language</p> <p>Barriers to communication and dealing with barriers.</p> <p>Handling nervousness/ discomfort.</p>	15
2	<p>Listening Skills</p> <p>Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening.</p> <p>Triple- A Listening - Attitude, Attention & Adjustment.</p> <p>Active Listening Skills.</p>	
3	<p>Motivational Training</p> <p>Characteristics Essential to Achieving Success</p> <p>The Power of Positive Attitude</p> <p>Self awareness</p> <p>Importance of Commitment</p> <p>Ethics and Values</p> <p>Ways to Motivate Oneself</p> <p>Personal Goal setting and Employability Planning.</p>	
4	<p>Facing Interviews</p> <p>Manners, Etiquettes, Dress code for an interview</p> <p>Do's & Don'ts for an interview</p>	
5	<p>Behavioral Skills</p> <p>Problem Solving</p> <p>Confidence Building</p> <p>Attitude</p>	

Topic No.	Topic	Duration (in hours)
	Entrepreneurship skill	
1	<p>Concept of Entrepreneurship</p> <p>Entrepreneurship - Entrepreneurship - Enterprises:- Conceptual issue Entrepreneurship vs. Management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.</p>	15
2	<p>Project Preparation & Marketing analysis</p> <p>Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of Product Life Cycle (PLC), Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.</p>	
3	<p>Institutions Support</p> <p>Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.</p>	
4	<p>Investment Procurement</p> <p>Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.</p>	
	Productivity	
1	<p>Productivity</p> <p>Definition, Necessity, Meaning of GDP.</p>	

2	Affecting Factors Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.	10
3	Comparison with developed countries Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.	
4	Personal Finance Management Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.	
	Occupational Safety, Health & Environment Education	
1	Safety & Health Introduction to Occupational Safety and Health importance of safety and health at workplace.	15
2	Occupational Hazards Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.	
3	Accident & safety Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.	
4	First Aid Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person	
5	Basic Provisions Idea of basic provision legislation of India. of safety, health, welfare under legislation of India.	
6	Ecosystem Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.	

7	Pollution Pollution and pollutants including liquid, gaseous, solid and hazardous waste.	
8	Energy Conservation Conservation of Energy, re-use and recycle.	
9	Global warming Global warming, climate change and Ozone layer depletion.	
10	Ground Water Hydrological cycle, ground and surface water, Conservation and Harvesting of water	
11	Environment Right attitude towards environment, Maintenance of in -house environment	
Labour Welfare Legislation		
1	Welfare Acts Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.	
Quality Tools		10
1	Quality Consciousness : Meaning of quality, Quality Characteristic	
2	Quality Circles : Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.	
3	Quality Management System : Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.	
4	House Keeping : Purpose of Housekeeping, Practice of good Housekeeping.	
5	Quality Tools Basic quality tools with a few examples	

8.2 BASIC NUMERACY

GENERAL INFORMATION

- 6) **Name of the subject** : **BASIC NUMERACY**
- 7) **Applicability** : ATS- Mandatory for fresher only
- 8) **Hours of Instruction** : 50 Hrs.
- 9) **Examination** : The examination will be held at the end of two years Training by CSDCI.
- 10) **Instructor Qualification** :

iii) MBA/BBA with two years experience or graduate in Science and Mathematics with two years experience and trained in Basic Numeracy from DGET Institute.

And

Must have studied in Mathematics at 12th /diploma level

8.2.1 SYLLABUS OF BASIC NUMERACY

Basic Training

Topic No.	Topic	Duration (in hours)
	English Literacy	50 Hrs
1	Number System/Fractions	
2	Square Root/Cube Root	
3	Average/Percentage	
4	Area Calculation- Triangles, Quadrilaterals	
5	Concept of geometry- Square, Rectangle, Circle, Triangle	
6	Basic Trigonometry	

8.3 PRACTICAL TRAINING (ON-JOB TRAINING)

(Part A & B)

DURATION: 18 MONTHS

Broad Skill Components to be covered during On-Job Training

On Job Training, Part A: 9 Months

- 1) CCTV Camera Installation
- 2) CCTV Camera Configuration
- 3) Network Video Recorder Installation
- 4) Network Video Recorder Configuration
- 5) Network Switch Installation and Configuration
- 6) CCTV Pole and Foundation Erection
- 7) Junction Box Installation
- 8) UPS Installation

On Job Training, Part B: 9 Months

- 1) Firewall Installation and Configuration
- 2) Monitor and Display Wall Installation and Configuration
- 3) Network Attached Storage Installation and Configuration
- 4) Wireless Communication device Installation and configuration
- 5) Server Installation and configuration
- 6) Cables and Termination
- 7) Passive Cabling
- 8) Testing and commissioning Equipment

4. Instructors Qualification:

- i)** Degree/Diploma in **Electrical and Electronics** Engg. from recognized university/Board With one/two year post qualification experience in the relevant field.

OR

- ii)** ITI in relevant trade with three year experience / 8 years' experience in the relevant field with 10th Qualification.

5. Infrastructure for On-Job Training: Ongoing Project sites

9. ASSESSMENT STANDARD

Assessment Guideline

Successful achievement of the partial assessment is the professional judgement of the instructor/assessor. Failure to demonstrate the appropriate practical skills and practices to the satisfaction of the Assessor will result in a failure of the course. The following area will be considered.

Selection of materials, Understanding of drawing, Quality of work (Functional aspects, Dimensional features, Surface finish), Personal safety, time taken to complete the job.

If the delegate fail a course the Training Provider must make a recommendation outline a time period required for the delegate to gain sufficient industry experinece prior to repete the course.

A sample assessment sheet is below

<u>Assesment Sheet - Cable Preparation</u>				
Name		Batch	Roll No	Allotted Time
1				
2				
SI No	Activities	Permitted Tolerance	Ob.Va	Asses (√/×)
1	Overall Length of Cable Prepared	10 mm		
2	Loose Tube damage during preparation	Visual		
3	CSM <u>Cuting</u> as per the length	2 mm		
4	Proper removal of Binders	Visual		
5	Proper cutting of Ripcord / Nylon	Visual		
6	Proper cleaning of Petroleum jelly	Visual		
7	Date			
8	Time of Commencement			
9	Time of Completion			
10	Time Taken			
11	Overall <u>assesment</u> (Pass / Fail)			
12	Demonstrator	Name		
		Signature		
13	Instructor	Name		
		Signature		

10. FURTHER LEARNING PATHWAYS

- On successful completion of the course trainees can opt for any charge hand/ foreman / supervisory course under CSDCI.

Employment opportunities:

On successful completion of this course, the candidates may be gainfully employed in the following industries:

1. Construction Sector – Structural activities.

ANNEXURE – I

TOOLS & EQUIPMENT FOR BASIC TRAINING

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

TRADE: Storage and Inventory Executive (warehouse/Manufacturing plant)

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

A : TRAINEES TOOL KIT:-

S.No	Description	UOM	QTY
1	Fixed BOX Box		
1.1	2 MP Outdoor Box Cameras with ,	Nos.	3
	NEMA 4X / IP-66 rated Housing		3
	lens		3
	Mounting bracket		3
2	PTZ Camera		
2.1	2 MP Outdoor PTZ Cameras with NEMA 4X / IP-66 rated Housing	Nos.	2
	24v ac POWER SUPPLY		2
	Mounting bracket		2
3	IR Dome Camera		
3.1	1 MP IR Dome Cameras with ABS/IP rated Housing with mounting bracket	Nos.	6
	12v 5A SMPS		3
4	Outdoor IR Bullet Camera		

4.1	2 MP Outdoor IR Bullet Cameras with NEMA 4X / IP-66 rated Housing with mounting bracket	Nos.	2
5	IR Illuminator		
5.1	40m IR Illuminators- with NEMA 4X / IP-66 rated Housing with mounting bracket	Nos.	2
6	Network Video Recorder		
6.1	8/16 Ch Network Video Recorder	Nos.	2
	12 V DC ADPATER		2
	USB OPTICAL MOUSE		2
	IR REMOTE		2
	1 TB HDD		2
7	Network Storage		
7.1	Network Storage With 6 Tb Hard disk	Nos.	1
	6TB (3 x 2TB SATA) HDD		1
	12V 7A POWER SUPPLY		1
8	Projector		
8.1	Projector	Nos.	2
8.2	Wall Type Pull Down Spring Action Projector Screen 6' X 8' size	Nos.	2
9	Work Station /Laptop		
9.1	Workstaion Intel Core i5 , 64bit x86 Processor	Nos.	3
10	Network Switch		

10.1	Switch should provide minimum 8 port	Nos.	2
	Added One SM module in one switch . One MM Module in other switch		
10.2	Layer 3 switch should provide minimum 24 port	Nos.	1
10.3	Router	Nos.	1
	12V 5.5A POWER SUPPLY		
10.4	Firewall	Nos.	1
	12V 2A ADAPTER		
10.5	Wireless Router	No	1
	12V 1.5 A ADAPTER		
11	UPS		
11.1	10 Kva Ups Wih 1 Hour Battery backup with SNMP card	No	1
	12V 65AH		16
11.2	1 Kva Ups Wih 30 min Battery backup with SNMP card	Nos.	1
	12V 26AH BATTERY		3
12	Junction Box With DCPS		
12.1	Outdoor IP55 Rated Junction Box	No	1
12.2	42U, 19" Rack	No	1
13	Cables		
13.2	cat6 cable	Box	2
13.3	12 core Single Mode Fiber	Mtrs	100

13.4	12 core Multi Mode Fiber	Mtrs	100
13.5	Armored 6 Sqmm*4 Core Cable	Mtrs	100
13.6	flexiable 2.5 Sqmm*3 Core Cable	Mtrs	100
13.7	MM LC-LC duplex Fiber Patch Chord , 3 Mts	Nos.	10
13.8	SM LC-LC duplex Fiber Patch Chord , 3 Mts	Nos.	10
13.9	SM LC-SC duplex Fiber Patch Chord , 3 Mts	Nos.	10
13.10	UTP CAT 6 Patch Chord (Black Color), 2 Mtr	Nos.	10
13.11	1C*25 Sqmm Earthing cable	Nos.	20
14	Earthing		
14.1	40mm Dia 2 mtrs length chemical Earth elctrode and Chemical compouds with Mouting accessoris and Chamber	Nos.	2
14.2	20*3 mm GI Earth Strip with necessary accessories	Mtrs	10
15	Camera Pole		
15.1	Hot Dip Galvanized pole, Min 6-10 Meters height, Min. 100 mm diameter pole	Nos.	1
16	Electrical Box		
16.1	FRB/Metal Standard Energy Meter Enclouser with Pole and Floor Mount arrangement	Nos.	1
16.2	32 A MCB with mounting accessories	Nos.	1
16.3	300ma RCCCB with mounting accessories	Nos.	1
17	Passive Material		

17.1	24 Port LC Fully Loaded LIU	Nos.	3
17.2	24 Port SC Fully Loaded LIU	Nos.	2
17.3	Outdoor Rated Fiber Joint Enclosre	Nos.	5
17.4	Splicing Kit Fusion Splicer	Nos.	1
17.5	Optical Time Domain Reflectometer (OTDR)	Nos.	1
17.6	850 nm optical Laser Sourse	Nos.	2
17.7	Visual fault indicator Range (3 km multimode, 4 km singlemode)	Nos.	1
17.8	Earth Test Megger	Nos.	1
17.9	Multi Meter	Nos.	2
17.10	LUX Meter	Nos.	1
17.11	LC Pic Tail	Nos.	30
17.12	SC Pic Tail	Nos.	30
17.13	FC Pic Tail	Nos.	30
17.14	RJ 45 jack	Nos.	300
17.15	Network lan Tester	Nos.	3
17.16	FLUK Meter/Tester	Nos.	1
17.17	Clamp Meter	Nos.	3
18	Tools and Tackles		
18.1	Screw Driver Kit	Nos.	5
18.2	Spanner Kit	Nos.	2

18.3	Wire Stripper	Nos.	10
18.4	Crimping tool	Nos.	5
18.5	Cutting plier	Nos.	5
18.6	Electrical Tester	Nos.	5
18.7	5/15A , 6 Socket With Fuse Protection Extension board	Nos.	5
18.8	hammer	Nos.	2
18.9	Sprit Level	Nos.	2
18.10	hand glove	Nos.	30
18.11	40mm DWD HDPE DUCT and Bend , coupler and Accessories	Mtrs	300
18.12	Allen key Set	Nos.	3
18.13	Wrench	Nos.	3
18.14	8 mm Anchor Net and Bolt	Nos.	30
18.15	10 mm Anchor Net and Bolt	Nos.	30
18.16	Insulation Tape	Nos.	20
18.17	Knief	Nos.	5
18.18	ferrole	Nos.	200
18.19	Waste cloth	Pkt	20
18.20	6 Sqmm cable Lug	Nos.	50
18.21	2.5 Sqmm cable Lug	Nos.	50
18.22	Electrical Lug Crimper	Nos.	2

19	Server		
19.1	86-64 Bit Min. 2.10 GHz ,RAM (64 GB), 2* 600GB Internal SAS HDD	Nos.	1
20	Softwares		
20.1	Video Management Software with 16 Camer License	Nos.	1
20.2	Windows Server 2016 (2 Core Packs)	Nos.	1
20.3	Anti virus software	Nos.	1
20.4	Basic EMS Software	Nos.	1
21	Wireless Radio		
21.1	1km Point to Point Radio	Pair	1

Note: In case of basic training setup by the industry the tools, equipment and machinery available in the industry may also be used for imparting basic training.

INFRASTRUCTURE FOR ON-JOB TRAINING

Actual training will be conducted at ongoing construction project sites

ANNEXURE-II

GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS

1. Due care to be taken for proper & inclusive delivery among the batch. Some of the following some method of delivery may be adopted:

- A) LECTURE
- B) LESSON
- C) DEMONSTRATION
- D) PRACTICE
- E) GROUP DISCUSSION
- F) DISCUSSION WITH PEER GROUP
- G) PROJECT WORK
- H) INDUSTRIAL VISIT

2. Maximum utilization of latest form of training viz., audio visual aids, integration of IT, etc. may be adopted.

3. The total hours to be devoted against each topic may be decided with due Diligence to safety & with prioritizing transfer of required skills.