

## 2 ELECTRONICS SECTOR SKILLS COUNCIL OF INDIA (ESSCI)

### 2.1 Consumer Electronics

#### ESDM Courses

Level Code:  Vertical Name:

Course Code:  Course Name:

#### Objective of the Course:

To train the person, who installs the air conditioner and interacts with customers to diagnose the problem and assess possible causes. Once the problem and causes have been identified, the individual rectifies minor problems or replaces faulty modules for failed parts or recommends factory repairs for bigger faults.

#### Learning Outcomes:

##### **NOS # ELE/N3101 - Engage with customer for service:**

1. Interact with the customer prior to visit
2. Interact with customer at their premises
3. Suggest possible solutions to customer
4. Achieve productivity and quality as per company's norms

##### **NOS # ELE/N3108 - Install Air Conditioner**

1. Undertake pre-installation site visit
2. Remove packaging and check accessories
3. Place the air conditioner at identified location
4. Check air conditioner's functioning
5. Complete the documentation
6. Interact with supervisor or superior
7. Achieve productivity and quality as per company's norms

##### **NOS # ELE /N3109 - Repair dysfunctional Air conditioner**

1. Understand the symptoms in the air-conditioner and identify the fault

2. Replace dysfunctional module in the air conditioner unit
3. Confirm functionality of the repaired unit
4. Achieve productivity and quality as per company's norms

**NOS # ELE/N9901 - Interact with colleagues**

1. Interact with supervisor or superior
2. Coordinate with colleagues

**Expected Job Roles:**

Filed Technician – Air Conditioner

**Duration of the Course (in hours)**

350 hours

**Minimum Eligibility Criteria and pre-requisites, if any**

10<sup>th</sup> Passed

**Professional Knowledge:**

**NOS # ELE/N3101 - Engage with customer for service:**

- KB1. company's products and recurring problems reported in consumer appliances
- KB2. how to communicate with customers in order to put them at ease
- KB3. basic electrical and mechanical modules of various appliances
- KB4. electronics involved in the type of appliance

Knowledge of the company / organization and its processes

**NOS # ELE/N3102 - Install the Air Conditioner**

- KB1. Installation-site requirements (structural requirements, ventilation, etc.)
- KB2. Different types of air conditioners such as window, split, cassette etc.
- KB3. different features and functionalities of various models
- KB4. safety precautions to be taken while installing

**NOS # ELE/N3103 - Repair dysfunctional Air Conditioner**

- KB1. different types of air conditioners, e.g., window, split air, cassette conditioners and differences in their operation
- KB2. features of different air conditioners of the company
- KB3. functioning of the appliance and its various modules
- KB4. method of air conditioning, its use and functioning of sealed system

KB5. Basics of types of refrigerants such as R12, R22, R134a, R290, R600a, R410, R32 use of different brazing sticks, types of brazing torches and their application  
 KB6. types of brazing torches, types of fluxes and their application  
 KB7. basic electronics (knowledge of components such as diode, transformer, LED, photo transistor, capacitor, resistor, inductor, thermistors)  
 KB8. functioning of various electromechanical parts of the air conditioner

**Professional Skill:**

1. **Interpersonal skills**
2. **Communication skills**
3. **Behavioural skills**
4. **Reading, writing and computer skills**
5. **Teamwork and multitasking**
6. **Documentation Skills**
7. **Reflective thinking**
8. **Critical Thinking**
9. **Decision Making**

**Core Skill:**

1. **Air conditioner operation**
2. **Using tools and machines**
3. **Fault diagnosis skills**

**Detailed Syllabus of Course**

Module. No	Module. Name	Minimum No. of Hours
	As per the NOSs listed in the Qualification pack	
<b>Total Theory / Lecture Hours:</b>		150
<b>Total Practical / Tutorial Hours:</b>		200
<b>Total Hours:</b>		350

**Recommended Hardware:**

1. Different type of Air conditioner
2. Multi-meter & Oscilloscope
3. Electrical Drill
4. Clamp meter, tube cutter, tube bender, vacuum pump, weigh scale, gas cylinder, temperature meter, pressure gauges

**Recommended Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA

## ESDM Courses

Level Code:  Vertical Name:

Course Code:  Course Name:

### Objective of the Course:

To train the person, who interacts with customers to install the appliance and diagnose the problem to assess possible causes of malfunction. Once the problem and causes have been identified, the individual rectifies minor problems or replaces faulty modules for failed parts or recommends factory repairs for bigger faults.

### Learning Outcomes:

#### **NOS # ELE/N3101 - Engage with customer for service:**

1. Interact with the customer prior to visit
2. Interact with customer at their premises
3. Suggest possible solutions to customer
4. Achieve productivity and quality as per company's norms

#### **NOS # ELE/N3112 - Install newly purchased refrigerator**

1. Remove packaging and check accessories
2. Place the appliance to appropriate location
3. Check refrigerator's functioning
4. Complete documentation
5. Interact with superior
6. Interact with and train service technicians
7. Achieve productivity and quality as per company's standards

#### **NOS # ELE /N3113 - Attend to service complaints - refrigerator**

1. Understand the symptoms and identify the fault
2. Replace dysfunctional module in the refrigerator unit
3. Confirm functionality of the repaired unit
4. Achieve productivity and quality as per company's standards

5. Interact with and train technicians

**NOS # ELE /N3114 - Install newly purchased air conditioner**

1. Undertake pre-installation site visit
2. Remove packaging and check accessories
3. Place the air conditioner at identified location
4. Check air conditioner's functioning
5. Complete the documentation
6. Interact with supervisor or superior
7. Interact with and train service technicians
8. Achieve productivity and quality as per company's norms

**NOS # ELE /N3115 - Attend to service complaints – Air Conditioner**

1. Understand the symptoms in the air-conditioner and identify the fault
2. Replace dysfunctional module in the air conditioner unit
3. Confirm functionality of the repaired unit
4. Interact with and train service technicians
5. Achieve productivity and quality as per company's norms

**NOS # ELE /N3116 - Install newly purchased washing machine**

1. Remove packaging and check accessories
2. Place the washing machine at appropriate location
3. Check washing machine's functioning
4. Complete documentation
5. Interact with superior
6. Interact with and train service technicians
7. Achieve productivity and quality as per company's standards

**NOS # ELE /N3117 - Attend to service complaints –washing machine**

1. Understand the symptoms and identify the fault
2. Repair the washing machine
3. Confirm functionality of the repaired unit

4. Achieve target as per company's policy
5. Interact with and train service technicians

**NOS # ELE/N9901 - Interact with colleagues**

1. Interact with supervisor or superior
2. Coordinate with colleagues

**Expected Job Roles:**

Filed Engineer - RACW

**Duration of the Course (in hours)**

350 hours

**Minimum Eligibility Criteria and pre-requisites, if any**

8<sup>th</sup> Std Passed

**Professional Knowledge:**

**NOS # ELE/N3101 - Engage with customer for service:**

- KB1. company's products and recurring problems reported in consumer appliances
- KB2. how to communicate with customers in order to put them at ease
- KB3. basic electrical and mechanical modules of various appliances
- KB4. electronics involved in the type of appliance

Knowledge of the company / organization and its processes

**NOS # ELE/ NOS # ELE/N3112 - Install newly purchased refrigerator:**

- KB1. Installation site requirements (structural requirements, ventilation, etc.)
- KB2. different types of refrigerators such as traditional, frost-free, Peltier
- KB3. different features and functionalities of various models
- KB4. safety precautions to be taken while installing
- KB5. manual-based procedure of installing the refrigerators
- KB6. packaging waste disposal procedures
- KB7. use of test equipment and tools such as multi-meter, oscilloscope
- KB8. other products of the company

**NOS # ELE /N3113 - Attend to service complaints - refrigerator**

- KB1. different types of refrigerators, e.g., frost free, direct cool and peltier refrigerators and differences in their operation

- KB2. features of different refrigerators of the company
- KB3. refrigeration cycle and functioning of the appliance and its various modules
- KB4. method of refrigeration, its use and functioning of refrigerator sealed system
- KB5. types of refrigerants such as R12, R22, R134a, R290, R600a, R410, R32 use of different brazing sticks, types of brazing torches and their application
- KB6. types of brazing torches, types of fluxes and their application
- KB7. basic electronics (knowledge of components such as diode, transformer, LED, photo transistor, capacitor, resistor, inductor, thermistor, ICs)
- KB8. functioning of various electromechanical parts of the refrigerator
- KB9. fundamentals of electricity such as ohms law, difference between ac and dc, calculation of energy consumption of appliances, understanding of domestic wiring, understanding of series and parallel connections

**NOS # ELE /N3114 - Install newly purchased air conditioner**

- KB1. Installation site requirements (structural requirements, ventilation, etc.)
- KB2. different types of air conditioners such as window, split, cassette etc.
- KB3. different features and functionalities of various models
- KB4. safety precautions to be taken while installing
- KB5. manual-based procedure of installing the air conditioner

**NOS # ELE /N3115 - Attend to service complaints – Air Conditioner**

- KB20. Basics of types of refrigerants such as R12, R22, R134a, R290, R600a, R410, R32 use of different brazing sticks, types of brazing torches and their application
- KB21. types of brazing torches, types of fluxes and their application
- KB22. basic electronics (knowledge of components such as diode, transformer, LED, transistor, capacitor, resistor, inductor, thermistor, ICs)
- KB23. functioning of various electromechanical parts of the air conditioner
- KB24. fundamentals of electricity such as ohms law, difference between ac and dc, calculation of energy consumption of appliances, understanding of domestic wiring, understanding of series and parallel connections
- KB25. troubleshooting knowledge with respect to air conditioners
- KB26. hazards, their causes and prevention/personal safety
- KB27. frequently occurring faults such as poor/no cooling, noisy unit, condensation water over flowing
- KB28. components/modules of the air conditioner and their prices
- KB29. energy ratings such BEE rating and concepts of e waste

**NOS # ELE /N3116 - Install newly purchased washing machine**

- KB1. installation-site requirements (structural and plumbing requirements)
- KB2. different types of washing machines such as front load and top load
- KB3. different features and functionalities of various models
- KB4. safety precautions to be taken while installing
- KB5. manual-based procedure of installing the washing machine

**NOS # ELE /N3117 - Attend to service complaints –washing machine**

- KB7. troubleshooting knowledge with respect to washing machine
- KB8. types of switches such as thermal, mechanical, electronic, magnetic, electromagnetic, electromechanical, pressure optical and bimetal
- KB9. fundamentals of motors, types of motors and their working methods
- KB10. functioning of components and parts such as solenoids and plungers

**Professional Skill:**



1. Interpersonal skills
2. Communication skills
3. Behavioural skills
4. Reading, writing and computer skills
5. Teamwork and multitasking
6. Documentation Skills
7. Reflective thinking
8. Critical Thinking
9. Decision Making

**Core Skill:**

1. Refrigerator operation
2. Air conditioner operation
3. Using tools and machines
4. Fault diagnosis skills

**Detailed Syllabus of Course**

Module. No	Module. Name	Minimum No. of Hours
	As per the NOSs listed in the Qualification pack	
<b>Total Theory / Lecture Hours:</b>		150
<b>Total Practical / Tutorial Hours:</b>		200
<b>Total Hours:</b>		350

**Recommended Hardware:**

1. Different type of Air conditioner
2. Different types of Refrigerator
3. Different types of Washing machine
4. Multi-meter & Oscilloscope
5. Electrical Drill
6. Clamp meter, tube cutter, tube bender, vacuum pump, weigh scale, gas cylinder, temperature meter, pressure gauges

**Recommended Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA

**ESDM Courses**

**Level Code:**  **Vertical Name:**

**Course Code:**  **Course Name:**

**Objective of the Course:**

**Assembly Operator – Refrigeration and Air-conditioning (RAC):** RAC Assembly Operator assembles and connects together the various modules and parts of the refrigerator or air conditioner.

**Brief Job Description:** The individual at work is responsible for assembling and wiring up of various components, modules or sub-assemblies and systems to make the complete product.

**Personal Attributes:** The individual must: have strength to lift heavy parts and modules, ability to work in high-decibel noise environment and in a standing position for long hours

**Learning Outcomes:**

**NOS # ELE/N3506 Assemble Refrigerator**

1. Understand requirement from the supervisor
2. Assemble the refrigerator
3. Report problems to supervisor
4. Achieve productivity, quality and safety standards as per company's norms

**NOS # ELE/N3507 Assemble Air conditioner**

1. Understand requirement from the supervisor
2. Assemble the air conditioner
3. Report problems to supervisor
4.  Achieve productivity, quality, and safety standards as per company's policy

**ELE/N9902- Coordinate with colleagues**

1. Interact with superior
2. Coordinate with colleagues

**ELE/N9903-Maintain safe work environment**

1. Follow standard safety procedures of the company
2. Participate in company's safety and fire drills
3. Maintain good posture at work for long term health

**Expected Job Roles:**

Assembly Operator-RAC

**Duration of the Course (in hours)**

350 hours

**Minimum Eligibility Criteria and pre-requisites, if any**

10<sup>TH</sup> + ITI or 12<sup>th</sup> Pass, Other non- Science graduate

**Professional Knowledge:**

**NOS # ELE/N3506 Assemble Refrigerator**

- KA1. company's policies on: incentives, delivery standards and personnel management
- KA2. reporting and documentation processes
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure

- KB1. electro-mechanical assembly instructions
- KB2. general principles of wiring and assembly, methods used and purpose of each
- KB3. circuit knowledge and functioning of different modules of the refrigerator
- KB4. principles of refrigeration, sealing systems
- KB5. methods of refrigeration and their uses
- KB6. types of compressors such as reciprocating, rotary, centrifugal, scroll and their functions
- KB7. different types of refrigerants such as R12, R22, R134a, R290, R600a, R410, R32
- KB8. safety norms in handling hydro carbon gases, nitrogen
- KB9. fundamentals of electricity such as Ohms law, difference between AC and DC, series and parallel connections
- KB10. basic electronics of components such as diode, transformer, LED, photo transistor, capacitor, resistor, inductor, thermistors
- KB11. how to read values of resistors, capacitors, diodes and integrated circuits with specific reference to colour coding, polarity, orientation, tolerance
- KB12. specific safety precautions that need to be taken while working in an electronic assembly unit
- KB13. personal protective equipment/gear such as goggles, gloves, rubber base shoes, etc., to be worn while carrying out wiring activities
- KB14. selection and maintenance of various tools used during the assembly process
- KB15. frequently occurring errors in the assembly process, causes and preventive measures
- KB16. continuous improvement processes and work place organization methods such as 5S and Kaizen

**NOS # ELE/N3507 Assemble Air conditioner**

KA1. company's policies on: incentives, delivery standards and personnel management  
KA2. reporting and documentation processes  
KA3. importance of the individual's role in the workflow  
KA4. reporting structure

KB1. electro-mechanical assembly instructions  
KB2. general principles of wiring and assembly, methods used and purpose of each  
KB3. circuit knowledge and functioning of different modules of the air conditioner  
KB4. principles of refrigeration, understanding of sealed systems, methods of refrigeration and their uses  
KB5. types of compressors such as reciprocating, rotary, centrifugal, scroll and their functioning  
KB6. different types of refrigerants such as R12, R22, R134a, R290, R600a, R410, R32  
KB7. safety norms in handling hydro carbon gases, nitrogen  
KB8. fundamentals of electricity such as Ohms law, difference between AC and DC, series and parallel connections  
KB9. basic electronics of components such as diode, transformer, LED, photo transistor, capacitor, resistor, inductor, thermister  
KB10. how to read values of resistors, capacitors, diodes and integrated circuits with specific reference to colour coding, polarity, orientation, tolerance  
KB11. specific safety precautions that need to be taken while working in an assembly unit  
KB12. personal protective equipment/gear such as goggles, gloves, rubber base shoes, etc., to be worn while carrying out wiring activities  
KB13. selection and maintenance of various tools used during the assembly process  
KB14. frequently occurring errors in the assembly process, causes and preventive measure.

**NOS# ELE/N9902 - Coordinate with colleagues**

KA1. company's policies on: incentives, delivery standards, and personnel management  
KA2. importance of the individual's role in the workflow  
KA3. reporting structure  
KB1. how to communicate effectively  
KB2. how to build team coordination

**NOS # ELE/N9903 - Maintain safe work environment**

KA1. company's policies on: incentives, delivery standards, and personnel management  
KA2. company occupational safety and health policy followed  
KA3. company emergency evacuation procedure  
KA4. company's medical policy

- KB1. how to maintain the work area safe and secure
- KB2. how to handle hazardous materials, tools and equipment
- KB3. emergency procedures to be followed such as fire accidents, etc.
- KB4. long term value of good posture and use of appropriate handling equipment

**Professional Skill:**

- i. **Electro-mechanical assembling skills**
- ii. **Using tools and machines**
- iii. **Interpersonal skills**
- iv. **Analytical and reflective skills**
- v. **Decision making skills**
- vi. **Reflective thinking**

**Core Skill:**

- 1. **Reading and Writing Skills**
- 2. **Team work**
- 3. **Multitasking**
- 4. **Documentation skills**

**Detailed Syllabus of Course**

Module. No	Module. Name	Minimum No. of Hours
	Assemble Refrigerator	
	Assemble Air conditioner	
	Coordinate with colleagues	
	Maintain safe work environment	
<b>Total Theory / Lecture Hours:</b>		175
<b>Total Practical / Tutorial Hours:</b>		225
<b>Total Hours:</b>		400

**Recommended Hardware:**

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**Recommended Software:**

NA
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**Text Books:**

NA
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**Reference Books:**

NA
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## ESDM Courses

Level Code:  Vertical Name:

Course Code:  Course Name:

### Objective of the Course:

To train the person who installs the set-top box at customer's premises; addresses the field serviceable complaints and coordinates with the technical team for activation of new connections

### Learning Outcomes:

#### NOS # ELE/N8105 - Install and repair DTH set-top box

1. Collect the customer's site details and carry necessary equipment and products
2. Install the set top box (DTH) at customer's site
3. Provide field service and resolve faults in case of complaint
4. Collect documents and forms filled by customer as per company's policy
5. Achieve productivity and quality targets as prescribed by company

#### NOS # ELE/N8102 - Comprehend customer's requirement

1. Interact with the customer prior to visit
2. Interact with customer at their premises
3. Suggest possible solutions to customer
4. Achieve productivity and quality as per company's norms

#### NOS # ELE/N9951 - Interact with other employees

1. Interact with supervisor or superior
2. Coordinate with colleagues

### Expected Job Roles:

DTH Setp-top Box Installer and Service Technician

Duration of the Course (in hours)

Minimum Eligibility Criteria



and pre-requisites, if any

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**Professional Knowledge:**

**NOS # ELE/N8101 - Install and repair DTH set-top box**

- KB1. basics of Geo stationery satellite and Other Communication Satellite
- KB2. azimuth, elevation and polarisation
- KB3. spectrum utilization
- KB4. optimum signal strength/ signal quality for good reception
- KB5. basics of input/output functions and block diagram of the set top box
- KB6. functions of the set top box and remote control
- KB7. structure of cable, parameters and the implications on signal
- KB8. basic functioning of tuners
- KB9. functioning of Low Noise Block Down Convertor (LNBC)
- KB10. basics of digital signals and difference in analogue and digital
- KB11. transmission of television signals and functioning of television sets
- KB12. specifications of different kind of inputs available on TV sets such as RF, AV, RGB, VGA, USB and HDMI
- KB13. digital signal processing chain including CAS and SMS

**NOS # ELE/N8102 - Comprehend customer's requirement**

- KA1. company's policies on: customer care
- KA2. company's code of conduct
- KA3. organisation culture and typical customer profile
- KA4. company's reporting structure
- KA5. company's documentation policy
  
- KB1. company's products and recurring problems reported in consumer appliances
- KB2. how to communicate with customers in order to put them at ease
- KB3. basic electrical and mechanical modules of various products
- KB4. electronics involved in the type of product
- KB5. models of different appliances and their common and distinguishing features
- KB6. etiquette to be followed at customer's premises
- KB7. precautions to be taken while handling field calls and dealing with customers
- KB8. relevant reference sheets, manuals and documents to carry in the field

**NOS # ELE/N9951 - Interact with other employees**

- KB1. how to communicate effectively
- KB2. how to build team coordination

**Professional Skill:**



**Recommended  
Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA

## ESDM Courses

Level Code:  Vertical Name:

Course Code:  Course Name:

### Objective of the Course:

To train the person who installs the set-top box at customer's premises; addresses the field serviceable complaints and coordinates with the technical team for activation of new connections

### Learning Outcomes:

#### NOS # ELE/N8101 - Install and repair DAS set-top box

1. Collect the customer's site details and carry necessary equipment and products
2. Install the set top box (DAS) at customer's site
3. Provide field service and resolve faults in case of complaint
4. Collect documents and forms filled by customer as per company's policy
5. Achieve productivity and quality targets as prescribed by company

#### NOS # ELE/N8102 - Comprehend customer's requirement

1. Interact with the customer prior to visit
2. Interact with customer at their premises
3. Suggest possible solutions to customer
4. Achieve productivity and quality as per company's norms

#### NOS # ELE/N9951 - Interact with other employees

1. Interact with supervisor or superior
2. Coordinate with colleagues

### Expected Job Roles:

DAS Setp-top Box Installer and Service Technician

Duration of the Course (in hours)

Minimum Eligibility Criteria

and pre-requisites, if any

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**Professional Knowledge:**

**NOS # ELE/N8101 - Install and repair DAS set-top box**

- KB1. optimum signal strength/ signal quality for good reception
- KB2. basics of input/output functions and block diagram of the set top box
- KB3. functions of the set top box and remote control
- KB4. structure of cable, parameters and the implications on signal
- KB5. basic functioning of tuners
- KB6. basics of digital signals and difference in analogue and digital
- KB7. transmission of television signals and functioning of television sets
- KB8. specifications of different kind of inputs available on TV sets such as RF, AV, RGB, VGA, USB and HDMI
- KB9. digital signal processing chain including CAS and SMS
- KB10. basics of Digital TV signal distribution through HFC network including elements of fibre, coaxial chain and devices such as nodes, amplifier, taps, splitter, etc., from head ends to input point of consumer premises for DAS
- KB11. concepts of modulation, demodulation, encryption, decryption, decoding, signal ingress, cross modulation, tuning, amplifying, coupling, attenuation, equalisation, digitising, etc., and their purposes
- KB12. commonly used terms and their meanings such as ECM, EMM, EPG-SDT, MPEG

**NOS # ELE/N8102 - Comprehend customer's requirement**

- KA1. company's policies on: customer care
- KA2. company's code of conduct
- KA3. organisation culture and typical customer profile
- KA4. company's reporting structure
- KA5. company's documentation policy
  
- KB1. company's products and recurring problems reported in consumer appliances
- KB2. how to communicate with customers in order to put them at ease
- KB3. basic electrical and mechanical modules of various products
- KB4. electronics involved in the type of product
- KB5. models of different appliances and their common and distinguishing features
- KB6. etiquette to be followed at customer's premises
- KB7. precautions to be taken while handling field calls and dealing with customers
- KB8. relevant reference sheets, manuals and documents to carry in the field

**NOS # ELE/N9951 - Interact with other employees**

- KB1. how to communicate effectively
- KB2. how to build team coordination

**Professional Skill:**

- i. **Interpersonal skills**
- ii. **Communication skills**
- iii. **Behavioural skills**
- iv. **Reading, writing and computer skills**
- v. **Teamwork and multitasking**
- vi. **Documentation Skills**
- vii. **Reflective thinking**
- viii. **Critical Thinking**
- ix. **Decision Making**

**Core Skill:**

- 1. **Installation and Repair Skills**
- 2. **Using tools and machines**

**Detailed Syllabus of Course**

<b>Module. No</b>	<b>Module. Name</b>	<b>Minimum No. of Hours</b>
	As per the NOSs listed in the Qualification pack	
<b>Total Theory / Lecture Hours:</b>		80
<b>Total Practical / Tutorial Hours:</b>		120
<b>Total Hours:</b>		200

**Recommended Hardware:**

- 1. Set top box
- 2. Television
- 3. Drilling machine, satellite meter, multi-meter
- 4. Lead tester, spanner, cutter
- 5. RF strength meter, QAM meter

**Recommended Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA

## ESDM Courses

Level Code:  Vertical Name:

Course Code:  Course Name:

### Objective of the Course:

To train the person who is responsible for attending to customer complaints, installing newly purchased products, troubleshooting system problems and, configuring peripherals such as printers, scanners and network devices.

### Learning Outcomes:

#### **NOS # ELE/N4601 - Engage with customer**

1. Interact with the customer prior to visit
2. Understand customer's requirements on visit or prior to visit
3. Suggest possible solutions
4. Complete the documentation
5. Achieve productivity and quality as per company's norms

#### **NOS # ELE/N4602 - Install, configure and setup the system**

1. Understand the installation requirement and install the hardware
2. Configure and install the peripherals
3. Check system functionality
4. Set up the software
5. Complete the installation task and report
6. Interact with customer
7. Interact with superior
8. Achieve productivity and quality as per company's norms

#### **NOS # ELE/N4603 - Troubleshoot and replace faulty module**

1. Receive and understand the customer complaint registered at customer care
2. Identify system problems on field visit
3. Replace faulty module after diagnosis
4. Interact with customer
5. Report to Superior

#### **NOS # ELE/N9909 - Coordinate with colleagues and co-workers**

1. Interact with supervisor or superior
2. Coordinate with colleagues

#### **Entrepreneurship**



**Expected Job Roles:**

Field Technician - Computing and Peripherals

**Duration of the Course (in hours)**

350 hours

**Minimum Eligibility Criteria and pre-requisites, if any**

12<sup>th</sup> pass

**Professional Knowledge:**

**NOS # ELE/N4601 - Engage with customer**

- KB1. company's products and recurring problems reported
- KB2. how to communicate with customers in order to put them at ease
- KB3. basic electronics of system hardware
- KB4. hardware maintenance
- KB5. functions of electrical and mechanical parts/ modules
- KB6. behavioural aspects and etiquette to be followed at customer's premises
- KB7. precautions to be taken while handling field calls and dealing with customers
- KB8. Relevant reference sheets, manuals and documents to carry in the field

**NOS # ELE/N4602 - Install, configure and setup the system**

- KB1. basic electronics involved in the hardware
- KB2. different types of IT hardware products and functionalities
- KB3. functions of electrical and mechanical parts/ modules
- KB4. typical customer profile
- KB5. company's portfolio of products and that of competitors
- KB6. installation procedures given in the manuals
- KB7. different types of equipment assembled in a pack (one system)
- KB8. different types of peripherals and their standard installation procedure
- KB9. specification and the procedures to be followed for setting up the system
- KB10. voltage and power requirement for different hardware devices
- KB11. memory, input, output and storage devices
- KB12. different modules in system such as SMPS, drivers, hard disk, battery, mother board
- KB13. different module in the peripheral and their functions
- KB14. how to operate the system and other hardware peripherals

**NOS # ELE/N4603 - Troubleshoot and replace faulty module**

- KB1. company's portfolio of products
- KB2. different types of IT hardware products and functionalities
- KB3. different electrical and mechanical modules in the product
- KB4. basic electronics of the hardware
- KB5. different models of devices and their repair procedures
- KB6. different equipments assembled in a pack (one system)

KB7. peripherals and their standard operating procedure for disassembling and re-assembling  
 KB8. procedures to be followed for trouble shooting and standards to follow  
 KB9. voltage and power requirement for different hardware devices  
 KB10. memory, input, output and storage devices

**NOS # ELE/N9909 - Coordinate with colleagues and co-workers**

KA1. company's policies on: incentives, delivery standards, and personnel management  
 KA2. importance of the individual's role in the workflow  
 KA3. reporting structure

KB1. how to communicate effectively  
 KB2. how to build team coordination

**Professional Skill:**

- i. **Interpersonal skills**
- ii. **Communication skills**
- iii. **Behavioural skills**
- iv. **Reading, writing and computer skills**
- v. **Teamwork and multitasking**
- vi. **Documentation Skills**
- vii. **Reflective thinking**
- viii. **Critical Thinking**
- ix. **Decision Making**

**Core Skill:**

- 1. **Installation and Repair Skills**
- 2. **Hardware and Software operation skills**
- 3. **Computer system and peripheral hardware related skills**
- 4. **Using tools and machines**

**Detailed Syllabus of Course**

<b>Module. No</b>	<b>Module. Name</b>	<b>Minimum No. of Hours</b>
	As per the NOSs listed in the Qualification pack	

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<b>Total Theory / Lecture Hours:</b>	150
<b>Total Practical / Tutorial Hours:</b>	200
<b>Total Hours:</b>	350

**Recommended Hardware:**

1. Computer, Laptop
2. Soldering iron, multimeter, POST cards
3. Printer, Scanner

**Recommended Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA

## ESDM Courses

Course Code:

EL/S/L5/C009

Course Name:

2.3.2 Field Technician – Networking and Storage

### Objective of the Course:

To train the person who responsible for attending to customer complaints, installing newly purchased products, troubleshooting system problems and, configuring hardware equipment such as servers, storage and other related networking devices

### Learning Outcomes:

#### **NOS # ELE/N4601 - Engage with customer**

1. Interact with the customer prior to visit
2. Understand customer's requirements on visit or prior to visit
3. Suggest possible solutions
4. Complete the documentation
5. Achieve productivity and quality as per company's norms

#### **ELE/N4612 Install, configure and setup the networking and storage system**

1. Understand the installation requirement and install the hardware
2. Configure and setup the network, servers and storage system
3. Check system functionality
4. Set up the software
5. Complete the installation task and report
6. Interact with customer
7. Interact with superior
8. Achieve productivity and quality as per company's norms

#### **ELE/N4613 Troubleshoot and fix equipment**

1. Receive and understand the customer complaint registered at customer care
2. Identify system problems on field visit
3. Replace faulty module after diagnosis
4. Coordinate with Remote Technical Helpdesk for assistance
5. Interact with customer
6. Report to Superior

#### **NOS # ELE/N9909 - Coordinate with colleagues and co-workers**

1. Interact with supervisor or superior
2. Coordinate with colleagues

### Expected Job Roles:

Field Technician – Networking and Storage

**Duration of the Course (in hours)**

400 hours

**Minimum Eligibility Criteria and pre-requisites, if any**

Diploma

**Professional Knowledge:**

**NOS # ELE/N4601 - Engage with customer**

- KB1. company's products and recurring problems reported
- KB2. how to communicate with customers in order to put them at ease
- KB3. basic electronics of system hardware
- KB4. hardware maintenance
- KB5. functions of electrical and mechanical parts/ modules
- KB6. behavioural aspects and etiquette to be followed at customer's premises
- KB7. precautions to be taken while handling field calls and dealing with customers
- KB8. Relevant reference sheets, manuals and documents to carry in the field

**ELE/N4612 Install, configure and setup the networking and storage system**

- KB1. basic electronics involved in the hardware
- KB2. different types of IT hardware products and functionalities
- KB3. functions of electrical and mechanical parts/ modules
- KB4. typical customer profile
- KB5. company's portfolio of products and that of competitors
- KB6. installation procedures given in the manuals
- KB7. different types of servers, storage, networking devices offered by the company
- KB8. different types of servers and storage hardware equipment and their standard installation procedure
- KB9. specification and the procedures to be followed for configuration and setting up the server system
- KB10. design architecture for system configuration
- KB11. networking of devices
- KB12. different types of networking devices, their functionality
- KB13. operate and load networking drivers

**ELE/N4613 Troubleshoot and fix equipment**

- KB1. company's portfolio of products
- KB2. different types of IT hardware products and functionalities
- KB3. different electrical and mechanical modules in the product
- KB4. basic electronics of the hardware
- KB5. different models of devices and their repair procedures
- KB6. standard operating procedure for disassembling and re-assembling of hardware equipment
- KB7. procedures to be followed for trouble shooting and standards to follow
- KB8. voltage and power requirement for different hardware devices
- KB9. servers, storage and network devices
- KB10. ERP software application and its installation procedure

**NOS # ELE/N9909 - Coordinate with colleagues and co-workers**

- KA1. company's policies on: incentives, delivery standards, and personnel management

KA2. importance of the individual's role in the workflow  
 KA3. reporting structure

KB1. how to communicate effectively  
 KB2. how to build team coordination

**Professional Skill:**

- i. **Interpersonal skills**
- ii. **Communication skills**
- iii. **Behavioural skills**
- iv. **Reading, writing and computer skills**
- v. **Teamwork and multitasking**
- vi. **Documentation Skills**
- vii. **Reflective thinking**
- viii. **Critical Thinking**
- ix. **Decision Making**

**Core Skill:**

- 1. **Installation and Repair Skills**
- 2. **Hardware and Software operation skills**
- 3. **Networking, Servers and storage hardware related skills**
- 4. **Using tools and machines**

**Detailed Syllabus of Course**

Module. No	Module. Name	Minimum No. of Hours
	As per the NOSs listed in the Qualification pack	
<b>Total Theory / Lecture Hours:</b>		
<b>Total Practical / Tutorial Hours:</b>		
<b>Total Hours:</b>		400

**Recommended Hardware:**

1. Computer, Laptop, networking devices
2. Soldering iron, multimeter, POST cards
3. Servers

**Recommended Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA

## ESDM Courses

Level Code:

III

Vertical Name:

IT Hardware

Course Code:

EL/S/L3/C004

Course Name:

2.3.3 Installation Technician – Computing and Peripherals

### Objective of the Course:

To train the person who is responsible for installing newly purchased products, troubleshooting system problems and, configuring peripherals such as printers, scanners and network devices

### Learning Outcomes:

#### NOS # ELE/N4601 - Engage with customer

1. Interact with the customer prior to visit
2. Understand customer's requirements on visit or prior to visit
3. Suggest possible solutions
4. Complete the documentation
5. Achieve productivity and quality as per company's norms

#### NOS # ELE/N4602 - Install, configure and setup the system

1. Understand the installation requirement and install the hardware
2. Configure and install the peripherals
3. Check system functionality
4. Set up the software
5. Complete the installation task and report
6. Interact with customer
7. Interact with superior
8. Achieve productivity and quality as per company's norms

#### NOS # ELE/N9909 - Coordinate with colleagues and co-workers

1. Interact with supervisor or superior
2. Coordinate with colleagues

#### Entrepreneurship

### Expected Job Roles:

Installation Technician - Computing and Peripherals

Duration of the Course (in

350 hours



hours)

**Minimum Eligibility Criteria  
and pre-requisites, if any**

10<sup>th</sup> Pass

**Professional Knowledge:**

**NOS # ELE/N4601 - Engage with customer**

- KB1. company's products and recurring problems reported
- KB2. how to communicate with customers in order to put them at ease
- KB3. basic electronics of system hardware
- KB4. hardware maintenance
- KB5. functions of electrical and mechanical parts/ modules
- KB6. behavioural aspects and etiquette to be followed at customer's premises
- KB7. precautions to be taken while handling field calls and dealing with customers
- KB8. Relevant reference sheets, manuals and documents to carry in the field

**NOS # ELE/N4602 - Install, configure and setup the system**

- KA6. company's line of business and product portfolio

- KB1. basic electronics involved in the hardware
- KB2. different types of IT hardware products and functionalities
- KB3. functions of electrical and mechanical parts/ modules
- KB4. typical customer profile
- KB5. company's portfolio of products and that of competitors
- KB6. installation procedures given in the manuals
- KB7. different types of equipment assembled in a pack (one system)
- KB8. different types of peripherals and their standard installation procedure
- KB9. specification and the procedures to be followed for setting up the system
- KB10. voltage and power requirement for different hardware devices
- KB11. memory, input, output and storage devices
- KB12. different modules in system such as SMPS, drivers, hard disk, battery, mother board
- KB13. different module in the peripheral and their functions
- KB14. how to operate the system and other hardware peripherals

**NOS # ELE/N9909 - Coordinate with colleagues and co-workers**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. importance of the individual's role in the workflow
- KA3. reporting structure

- KB1. how to communicate effectively
- KB2. how to build team coordination

**Professional Skill:**

- i. **Interpersonal skills**
- ii. **Communication skills**
- iii. **Behavioural skills**
- iv. **Reading, writing and computer skills**
- v. **Teamwork and multitasking**
- vi. **Documentation Skills**
- vii. **Reflective thinking**
- viii. **Critical Thinking**
- ix. **Decision Making**

**Core Skill:**

- 1. **Installation and Repair Skills**
- 2. **Hardware and Software operation skills**
- 3. **Computer system and peripheral hardware related skills**
- 4. **Using tools and machines**

**Detailed Syllabus of Course**

<b>Module. No</b>	<b>Module. Name</b>	<b>Minimum No. of Hours</b>
	As per the NOSs listed in the Qualification pack	
<b>Total Theory / Lecture Hours:</b>		150
<b>Total Practical / Tutorial Hours:</b>		200
<b>Total Hours:</b>		350

**Recommended Hardware:**

- 1. Computer, Laptop
- 2. Soldering iron, multimeter, POST cards
- 3. Printer, Scanner

**Recommended Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA

## ESDM Courses

Level Code:

III

Vertical Name:

IT Hardware

Course Code:

EL/S/L3/C014

Course Name:

2.3.4 CCTV Installation technician

### Objective of the Course:

**CCTV Installation Technician:** Also called 'CCTV Installer', the CCTV installation Technician provides after sale support services to customers, typically, at their premises

**Brief Job Description:** The individual at work is responsible for installing the CCTV system in the customer premises. The individual understand the customer and site requirement, installs the camera and integrates the hardware for effective CCTV surveillance system functioning.

**Personal Attributes:** The job requires the individual to have: ability to build interpersonal relationships, patience, listening skills and critical thinking. The individual must be willing to travel to client premises in order to install equipment at different locations.

### Learning Outcomes:

#### NOS # ELE/N4609- Visit site and understand customer requirement

1. Interact with the customer
2. Understand their requirements
3. Visit the site
4. Understand the site condition and requirement
5. Suggest possible solutions
6. Decide on the CCTV system to be installed
7. Achieve productivity and quality standards

#### ELE/N4610 Install the CCTV camera

1. Procure the hardware required for installation
2. Test the hardware before installation
3. Connect the cables
4. Install and setup the camera
5. Use appropriate tools and equipments for installation
6. Achieve productivity and quality standards

#### ELE/N4611 Setup the CCTV surveillance system

1. Connect CCTV camera and DVR with system
2. Set up CCTV system
3. Ensure system functioning, perform demo
4. Complete installation, report
5. Interact with customer
6. Interact with Supervisor
7. Achieve productivity and quality as per company's norms

**NOS # ELE/N9909 - Coordinate with colleagues and co-workers**

1. Interact with supervisor or superior
2. Report potential areas of disruptions to work process
3. Spot process disruptions and delays
4. Coordinate with colleagues

**Expected Job Roles:**

CCTV Installation technician

**Duration of the Course (in hours)**

350 hours

**Minimum Eligibility Criteria and pre-requisites, if any**

10<sup>th</sup> Passed

**Professional Knowledge:**

**NOS # ELE/N4609- Visit site and understand customer requirement**

- KA1. company's policies on: customer care, warranties, products
- KA2. company's code of conduct
- KA3. organization culture and typical customer profile
- KA4. company's reporting structure
- KA5. company's documentation policy
- KA6. company's service level agreements and policies

- KB1. CCTV camera installation requirement in terms of equipment, system , tools, applications appropriate for a particular site
- KB2. preparation of field and site for camera installation
- KB3. design criteria for CCTV camera installation
- KB4. location criteria for CCTV camera installation
- KB5. different types of CCTV equipment in the market, their specifications and prices
- KB6. different types of CCTV camera and associated systems
- KB7. different types of DVR and their purposes
- KB8. tools and equipment to carry for installations
- KB9. precautions to be taken while handling field calls and dealing with customers
- KB10. relevant reference sheets, manuals and documents to carry in the field

**ELE/N4610 Install the CCTV Camera**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. company's sales and after sales support policy
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KA5. company's policy on product's warranty and other terms and conditions
- KA6. company's line of business and product portfolio
- KA7. company's customer support and service policy

- KB1. basic electronics involved in the hardware
- KB2. basic electrical and wiring
- KB3. different types of electronic surveillance products and functionalities
- KB4. functions of electrical and mechanical parts or modules
- KB5. typical customer profile
- KB6. elements of CCTV systems such as camera, DVR, monitor
- KB7. company's portfolio of products and that of competitors
- KB8. installation procedures given in the manuals
- KB9. specification and the procedures to be followed for setting up the system
- KB10. different type of cables used for data transmission and power transmission
- KB11. power requirement of different CCTV related equipment
- KB12. video recording of footage – analog and digital
- KB13. different types of camera available in the market
- KB14. camera specifications such as focus, lens type, zoom
- KB15. controls of different options in camera such as rotation, speed of movement in pan / tilt camera
- KB16. voltage and power requirement for different hardware devices
- KB17. how to operate the system and other hardware
- KB18. safety rules, policies and procedures
- KB19. quality standards to be followed

#### **ELE/N4611 Setup the CCTV surveillance system**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. company's sales and after sales support policy
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KA5. company's policy on product's warranty and other terms and conditions
- KA6. company's line of business and product portfolio

- KB1. different types of electronic surveillance products and functionalities
- KB2. functions of electrical and mechanical parts/ modules
- KB3. specification and the procedures to be followed for setting up the system
- KB4. different type of cables used for data transmission and power transmission
- KB5. power requirement of different CCTV related equipment
- KB6. video recording of footage – analog and digital
- KB7. different types of camera available in the market
- KB8. camera specifications such as focus, lens type, zoom
- KB9. controls of different options in camera such as rotation, speed of movement
- KB10. voltage and power requirement for different hardware devices
- KB11. integration of hardware to setup the system
- KB12. parameters and specification for different types of system integration
- KB13. accessing image from remote locations
- KB14. CCTV monitoring and control over IP network / Internet
- KB15. IP technology and networking principles
- KB16. basics of networking

- KB17. video recording technologies
- KB18. controls in digital video recorder and their usage
- KB19. how to operate the system and other hardware
- KB20. safety rules, policies and procedures
- KB21. quality standards to be followed

**NOS # ELE/N9909 - Coordinate with colleagues and co-workers**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. importance of the individual's role in the workflow
- KA3. reporting structure

- KB1. how to communicate effectively
- KB2. how to build team coordination

**Entrepreneurship**

**Professional Skill:**

- x. **Interpersonal skills**
- xi. **Communication skills**
- xii. **Behavioural skills**
- xiii. **Reading, writing and computer skills**
- xiv. **Teamwork and multitasking**
- xv. **Reflective thinking**
- xvi. **Critical Thinking**
- xvii. **Decision Making**

**Core Skill:**

- 5. **Installation and Repair Skills**
- 6. **Hardware and Software operation skills**
- 7. **Networking, Servers and storage hardware related skills**
- 8. **Using tools and machines**

**Detailed Syllabus of Course**

Module. No	Module. Name	Minimum No. of Hours
	Visit site and understand customer requirement	
	Install the CCTV Camera	
	Setup the CCTV surveillance system	
	Coordinate with colleagues and co-workers	
<b>Total Theory / Lecture Hours:</b>		150

<b>Total Practical / Tutorial Hours:</b>	200
<b>Total Hours:</b>	350

<b>Recommended Hardware:</b>	<ol style="list-style-type: none"><li>1. Different types of CCTV Camera</li><li>2. DVR, Monitor, Key board mouse &amp; their hardware</li><li>3. Storage device</li><li>4. Diagonal cutters, screwdrivers, crimp tools, knife for cabling and camera mounting</li></ol>
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<b>Recommended Software:</b>	NA
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<b>Text Books:</b>	NA
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<b>Reference Books:</b>	NA
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## ESDM Courses

Level Code:  Vertical Name:

Course Code:  Course Name:

### Objective of the Course:

**Access Controls Installation Technician:** Also called 'Access Control Device Installer', the Access Control Installation Technician provides after sale support services for access control devices and systems such as point of sale scanners, finger print or iris scan.

**Brief Job Description:** The individual at work is responsible for installing the access control system at the customer's premises. The individual undertakes site assessment, installs the hardware and integrates the system to meet customer's requirement.

**Personal Attributes:** The job requires the individual to have: ability to build interpersonal relationships, patience, listening skills and critical thinking. The individual must be willing to travel to client premises in order to install equipment at different locations.

### Learning Outcomes:

#### **NOS #ELE/N4616 - Engage with customer for installation**

1. Interact with customer to assess their requirement
2. Visit site to understand infrastructure required
3. Suggest possible solutions

#### **ELE /N4617 Install and setup the access control system both Hardware and Software**

1. Procure the hardware required for installation
2. Test the access control hardware before installation
3. Install the wiring
4. Install and setup the access controls
5. Setup the system
6. Use appropriate tools and equipment for installation

#### **ELE/N9909 Coordinate with colleagues and co-workers**

1. Interact with supervisor or superior
2. Coordinate with colleagues

### Expected Job Roles:

Access Controls Installation Technician

**Duration of the Course (in hours)**

350 hours

**Minimum Eligibility Criteria and pre-requisites, if any**

10<sup>th</sup> Passed

**Professional Knowledge:**

**NOS # ELE/N4616 - Engage with customer for installation**

- KA1. company's policies on: customer care, warranties, products
- KA2. company's code of conduct
- KA3. organization culture and typical customer profile
- KA4. company's reporting structure
- KA5. company's documentation policy
- KA6. company's service level agreements and policies

- KB1. access control device system and their applications
- KB2. basic concepts operating different types of scanners
- KB3. field and site assessment for access control equipment installation
- KB4. design for access control system installation
- KB5. different types of access control equipment in the market, their specifications and price
- KB6. different types of data information storage device and their purpose
- KB7. safety precautions to be taken while installing
- KB8. reference sheets, manuals and documents to carry in the field

**NOS# ELE/N4617 Install and setup the access control system**

- KB1. basic electronics involved in the hardware
- KB2. basic electrical and wiring techniques
- KB3. different types of access control products and functionalities
- KB4. functions of electrical and mechanical parts/ modules
- KB5. typical customer profile
- KB6. dismantling and assembling of hardware equipment
- KB7. access control system concepts such as for master controller, card reader, door control units, smart-hub, etc.
- KB8. company's portfolio of products and that of competitors
- KB9. installation procedures given in the manuals
- KB10. specification and the procedures to be followed for setting up the system
- KB11. different type of cables used for data transmission and power transmission
- KB12. power requirement of hardware
- KB13. different types of access controls hardware available in the market
- KB14. software requirement associated with access controls
- KB15. computing system and operating system requirements for access control system installation
- KB16. voltage and power requirement for different hardware devices
- KB17. how to operate the system and other hardware
- KB18. all safety rules, policies and procedures
- KB19. quality standards to be followed

**NOS # ELE/N9909 - Coordinate with colleagues and co-workers**

KA1. company's policies on: incentives, delivery standards, and personnel management  
 KA2. importance of the individual's role in the workflow  
 KA3. reporting structure

KB1. how to communicate effectively  
 KB2. how to build team coordination

**Entrepreneurship Module**

**Professional Skill:**

- i. **Interpersonal skills**
- ii. **Communication skills**
- iii. **Behavioural skills**
- iv. **Reading, writing and computer skills**
- v. **Hardware and electrical skills**
- vi. **Reflective thinking**
- vii. **Critical Thinking**
- viii. **Decision Making**
- ix. **Using tools and equipment**

**Core Skill:**

- 1. **Reading and writing skills**
- 2. **Teamwork and multitasking**

**Detailed Syllabus of Course**

Module. No	Module. Name	Minimum No. of Hours
	Engage with customer for installation	
	Install and setup the access control system	
	Coordinate with colleagues and co-workers	
		150
<b>Total Practical / Tutorial Hours:</b>		200
<b>Total Hours:</b>		350

**Recommended Hardware:**

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**Recommended Software:**

NA
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**Text Books:**

NA
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**Reference Books:**

NA
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## ESDM Courses

**Level Code:**  **Vertical Name:**

**Course Code:**  **Course Name:**

### Objective of the Course:

To train the person, who checks the installation site, understands the layout requirement as per design, assesses precautionary measures to be taken, installs the solar panel as per customer's requirement and ensures effective functioning of the system post installation.

### Learning Outcomes:

#### **NOS # ELE/N5901 Check site conditions, collect tools and raw materials**

1. Understand the work requirement
2. Check out and assess the site condition
3. Understand the installation requirement
4. Collect materials required for installation
5. Ensure quality material usage and appropriate handling mechanism

#### **NOS # ELE/N5902 Install the solar panel**

1. Understand the installation and material usage procedure
2. Assess mounting requirements
3. Install the solar panel
4. Connect the system and check for functioning
5. Report and document completion of work
6. Follow quality and safety procedures

#### **NOS # ELE/N9952 Coordinate colleagues at work**

1. Interact with supervisor or superior
2. Coordinate with colleagues

#### **NOS # ELE/N9953 Ensure safety at workplace**

Follow standard safety procedures while handling an equipment

Participate in company's safety drills and workshops

### Expected Job Roles:

Solar Panel Installation Technician

**Duration of the Course (in hours)**

350 hours

**Minimum Eligibility Criteria and pre-requisites, if any**

12<sup>th</sup> passed

**Professional Knowledge:**

**NOS # ELE/N5901 Check site conditions, collect tools and raw materials**

- KB1. basics on solar energy and power generation systems
- KB2. use and handling procedure of solar panels
- KB3. energy storage, control and conversion
- KB4. basic electrical system and functioning
- KB5. mechanical equipment and its functioning
- KB6. maintenance procedure of equipment
- KB7. site survey, design and evaluation of various parameters
- KB8. tools involved in installation of system
- KB9. quality and process standards
- KB10. occupational health and safety standards

**NOS # ELE/N5902 Install the solar panel**

- KB2. solar energy system components such as panels, batteries, charge controllers, inverters
- KB3. significance of volts, amps and watts: series and parallel connection
- KB9. voltage requirement of various equipment
- KB10. panel mounting and inclination and angle of tilt
- KB11. placement of solar panel mounting
- KB12. sunlight and direction assessment
- KB13. site surveying methods and evaluation parameters
- KB14. tools involved in installation of system

**NOS # ELE/N9952 Coordinate colleagues at work**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. importance of the individual's role in the workflow
- KA3. reporting structure
  
- KB1. how to communicate effectively
- KB2. how to build team coordination

**NOS # ELE/N9953 Ensure safety at workplace**

- KB1. how to maintain the work area safe and secure
- KB2. how to handle hazardous material
- KB3. how to operate hazardous tools and equipment
- KB4. emergency procedures to be followed such as fire accidents, etc.

**Professional Skill:**

- |      |   |
|------|---|
| i.   | <b>Communication skills</b>                 |
| ii.  | <b>Reading, writing and computer skills</b> |
| iii. | <b>Teamwork and multitasking</b>            |
| iv.  | <b>Reflective thinking</b>                  |
| v.   | <b>Analytical thinking</b>                  |
| vi.  | <b>Critical Thinking</b>                    |
| vii. | <b>Decision Making</b>                      |

**Core Skill:**

- |    |                                  |
|----|----------------------------------|
| 1. | <b>Panel Installation Skills</b> |
| 2. | <b>Using Tools and Machines</b>  |
| 3. | <b>Handling Safety Equipment</b> |

**Detailed Syllabus of Course**

<b>Module. No</b>	<b>Module. Name</b>	<b>Minimum No. of Hours</b>
	As per the NOSs listed in the Qualification pack	
	<b>Total Theory / Lecture Hours:</b>	48
	<b>Total Practical / Tutorial Hours:</b>	72
	<b>Total Hours:</b>	120

**Recommended Hardware:**

- |    |   |
|----|---|
| 1. | Different types of Solar panels   |
| 2. | Screw driver, inspection fixtures, wire cutter, pliers, tester, spanner |
| 3. | Different types of Battery  |

**Recommended Software:**

NA
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**Text Books:**

NA

**Reference Books:**

NA



## ESDM Courses

**Level Code:** L1 **Vertical Name:** Photovoltaic Segment (Solar Panel)

**Course Code:** EL/S/L1/C010 **Course Name:** 2.4.2 Emergency Light & Solar Lantern

### Objective of the Course:

This Course has been design to provide an introduction to use of Solar Appliances, their assembly, repair and maintenance and installation.

### Learning Outcomes:

At the end of the course the learners will be able:

- To assemble the solar lantern and emergency light
- To install solar panels and solar system
- To know the detail operation of solar appliances
- Repair and maintenance of solar lantern, solar panel and emergency light.

### Expected Job Roles:

This course will contribute the job potential in the following field:

- Repairing and service centre
- Solar equipments assembling industries
- Different Government Agencies responsible for dissemination/installation of solar equipments as UREDA Uttarakhand
- Different Electronics Industries

**Duration of the Course (in hours)** 200 Hrs.

**Minimum Eligibility Criteria and pre-requisites, if any** 8<sup>th</sup> Pass having Knowledge of Basic Science

**Professional Knowledge:**

By completing the course the students is supposed to have the following profession knowledge:

- Basics of Electronics
- Working principle and operation of emergency light, solar lantern, battery and solar panels
- Maintenance of Solar appliances

**Professional Skill:**

- Trouble shooting of Emergency light, Solar lantern
- Preventive and corrective maintenance of solar appliances
- Charging/Discharging and reconditioning of battery

**Core Skill:**

The following core Skill is to be supposed for the learners

- Basics of Electronics Principles
- Different Electronic and Electrical active and passive components
- Idea of Electronic Circuits
- Application and operation of different Electronic Equipments as multimeter, CRO etc.
- Core efficiencies in soldering practices and use of different related tools
- Knowledge of solar panels and battery
- Preventive and corrective maintenance of related appliances

**Detailed Syllabus of Course**

S.No.	Topic	Hours	
		Theory	Practical/ Tutorial
1.	Introduction to Basic Electronics	10	20
2.	Trouble shooting Tools and Equipments	10	20
3.	Working principle of Emergency lights	05	20
4.	Working principle of Solar Lantern	05	20
5.	Battery	10	20
6.	Solar Panels	10	20
7.	Repair and maintenance of Emergency Light and Solar Lantern	10	20
	<b>TOTAL</b>	<b>60</b>	<b>140</b>

Detailed Syllabus

1. Introduction to Basic Electronics

10 Hrs.

Topic
Introduction to Electronics, Types of Material
Intrinsic Semiconductor, Extrinsic Semiconductor
Semiconductor, N-Type Semiconductor, P-Type Semiconductor, Conductivity of N-Type and P-Type Semiconductor
Charge on N-Type and P-Type Semiconductor, Majority and Minority carrier in Semiconductor
PN-Junction, Properties of PN junction
Applying voltage across PN-junction, Current Flow in PN junction
V-I characteristics of PN- junction
Semiconductor diode, Working of diode, specification of diode
Active and Passive component, Testing, Identification, Properties
Rectifier Circuit, Measurement of Voltage, Current and resistance power supply

2. Trouble shooting Tools and Equipments

10Hrs.

Topic
Introduction to Multimeter, Oscilloscope, Soldering/desoldering station, vacuum cleaner, brush, forceps, screw driver set, cutter, pliers, soldering iron, soldering iron, soldering wire, desoldering pump
Soldering Wire Solution, Soldering flux solution, cleaning solution, soldering and Desoldering technique

3. Working principle of Emergency lights

05 Hrs.

Topic
Introduction to Emergency Light, Charger Circuit
Working of Tube Light used in Emergency Light
Inverter circuit used in Emergency Light
Change over circuit, change over time, component used in change over circuit

4. Working principle of Solar Lantern

05Hrs.

Topic
Introduction to Solar, Solar Devices
Introduction Solar Lantern, CFL for Solar Lantern
Control Circuit, Sensor Circuit
Voltage Controller Circuit, Charge Circuit

5. Battery

10 Hrs.

Topic
Introduction to Battery, types of Battery
Principle of Cell, Charge on Cell
Charging and discharging of Battery
Lead-Acid Battery
Maintenance free battery
Preventive maintenance of Battery

6. Solar Panels

10Hrs.

Topic
Element of Solar Light
Working of Solar panel

7. Repair and maintenance of Emergency Light and Solar Lantern

10 Hrs.

Topic
Troubleshooting techniques
Fault Finding
Precaution during fault finding
Fault diagnosis of Emergency Light
Fault diagnosis of Solar Lantern
Removing faulty component in Emergency Light
Removing faulty component in Solar Lantern
Safety Precaution, Preventive maintenance of emergency light and Solar Lantern

**Recommended Hardware:**

<b>Particulars</b>	
1.Digital Multimeter	02 No.
2.CRO dual Trace	01 No.
3 Electronic Tool Kits	03 No.
4.Battery Charger	01 No.
5.Emergency Light	02 No
6.Solar Lantern with Solar Panel	02 No.
7.Lead-Acid Battery	02 No.
8 Solar Panel	03 No.

**Recommended Software:**

NIL

**Text Books:**

- 1- Concentrating Solar Power Technologies by Keith Lovegrove and west Stein
- 2- Crystalline Silicon Solar cells by Armin G. Aberle.
- 3- Third Generation Photovoltaic by Martin A.Green

**Reference Books:**

- 1- Silicon Solar cell by Martin A. Green
- 2- Solar Electricity Hand Book 2014 Edition by Michael Box Well
- 3- Solar Power Our Home for Dummlles by Rik De Gunther

## ESDM Courses

<b>Level Code:</b>	4	<b>Vertical Name:</b>	Solar Electronics
<b>Course Code:</b>	EL/S/L4/C020	<b>Course Name:</b>	2.4.3 Tech Support

### Objective of the Course:

**Tech Support:** Responsible for collecting Customer requirements by visiting the site and suggest for suitable Solar and LED products model. Also suggest new design to Design team as per Customer's new requirement.

**Brief Job Description:** The individual at work evaluates the installation site, helps in designs the Solar system and support in Design, plans arranges for materials and ensures smooth installation process.

**Personal Attributes:** The individual must have: attention to detail, good eye sight, logical thinking, analytical ability and good interpersonal skills.

### Learning Outcomes:

#### NOS # ELE/N5907 Customer interaction

- 1 Understand the work requirement
- 2 Engage with customers to understand their requirement
- 3 Visit and evaluate the site for installation
- 4 Suggest suitable model of Solar and LED system
- 5 Support to design new model is the Customer
- 6 Collect the required material for installation
- 7 Support in Install the Solar and LED products as per Customer requirement
- 8 Ensure quality, standards and regulatory requirement are adhered

**ELE/N5601 Develop product and market understanding**

- a. Understand the work requirement
- b. Understand about the product
- c. Study and research about the market
- d. Coordinate with channel partners
- e. Initiate meeting with the prospective client
- f. Interact and understand the client requirement
- g. Record the client details and document the visit
- h. Achieve productivity targets set by the company

**ELE/N5602 Sell the products and services**

- a. Offer possible solutions to customers
- b. Close the sales
- c. Coordinate with channel partners and offer suggestions to improve sales
- d. Offer proper documentation and understand post purchase requirements
- e. Assist client with installation service
- f. Maintain relationship with client
- g. Achieve productivity targets set by the company

**NOS # ELE/N9953 Ensure safety at workplace**

- 1. Follow standard safety procedures while handling an equipment
- 2. Participate in company's safety drills and workshops

**Entrepreneurship Module**

**Expected Job Roles:**

Solar & LED Technician

**Duration of the Course  
(in hours)**

350 Hrs

**Minimum Eligibility  
Criteria and pre-  
requisites, if any**

10<sup>th</sup> +ITI / 12<sup>th</sup> pass / Other non-science graduates

**Professional Knowledge:**

**Professional Skill:**

i.	<b>Interpersonal skills</b>
ii.	<b>Behavioural skills</b>
iii.	<b>Reflective thinking</b>
iv.	<b>Critical Thinking</b>
v.	<b>Decision Making</b>
vi.	<b>Using tools and machines</b>

**Core Skill:**

1.	Using tools and machines
2.	Assembling Skills
3.	Reading, writing and computer skills
4.	Teamwork and multitasking
5.	Communication skills

**Detailed Syllabus of Course:**

<b>S. No.</b>	<b>Module. Name</b>	<b>Duration</b>
1	Customer interaction	
2	Develop product and market understanding	
3	Sell the products and services	
4	Ensure safety at workplace	
	<b>Total Theory/Lecture</b>	140 Hrs
	<b>Total Practical / Tutorial Hours:</b>	210 Hrs
	<b>Total Hours:</b>	350 Hrs

**Recommended Hardware:**

Different types of Solar home lighting system, DC system, Different types of Solar panels, Different types of LED lights, Solar lanterns, Multimeter,



Mechanical fixtures,

**Recommended Software:**

**Text Books:**

**Reference Books:**

## 2.5 PCB Assembly

### ESDM Courses

**Level Code:**  **Vertical Name:**

**Course Code:**  **Course Name:**

#### Objective of the Course:

To train the person, who programs, operates and maintains the automated pick-and-place machine for placing different types of components on the surface of PCBs for soldering.

#### Learning Outcomes:

##### **NOS # ELE/N5102 - Operate pick-and-place machine**

1. Program and load the pick and place machine
2. Load components and operate the machine for assembling on PCBs
3. Check visually and ensure after assembly cycle is complete
4. Undertake preventive maintenance on the machine
5. Achieve productivity and quality standards

##### **NOS # ELE/N9919 - Work with superiors and colleagues**

1. Interact with supervisor or superior
2. Coordinate with colleagues

##### **NOS # ELE/N9920 - Follow safety procedures**

1. Understand potential sources of accidents
2. Use safety gear to avoid accidents
3. Understand the safety procedures followed by the company

**Expected Job Roles:**

Pick and Place Operator

**Duration of the Course (in hours)**

350 hours

**Minimum Eligibility Criteria and pre-requisites, if any Professional Knowledge:**

12<sup>th</sup> Passed

**NOS # ELE/N5102 - Operate pick-and-place machine**

- KB1. basic electronics and component identification
- KB2. pick-and-place machine functioning and controls
- KB3. basic programming and loading
- KB4. setting up, loading pick-and-place machine
- KB5. techniques of cleaning stencil
- KB6. colour codes and polarity of components
- KB7. regulation of operating speed and temperature
- KB8. LEDs and special mounting technique, junction temperature, types of assembly, metal core PCB, spike correction
- KB9. operation of LED mounting machine
- KB10. Electro-static discharge (ESD) precautions
- KB11. manual soldering and rework of SMT components
- KB12. PCB design basics
- KB13. commonly occurring machine defects

**NOS # ELE/N9917 - Interact with superiors and colleagues**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. work flow involved in company's process
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KB1. how to communicate effectively
- KB2. how to build team coordination

**NOS # ELE/N9918 - Follow safety standards**

- KB1. how to maintain the work area safe and secure
- KB2. how to handle hazardous material
- KB3. how to follow safety procedures while operating hazardous tools and equipment
- KB4. emergency procedures to be followed such as fire accidents and fire safety education
- KB5. how to use machines and tools without causing bodily harm



**Total Hours:** 120

**Recommended Hardware:**

- 1. Pick and Place system
- 2. Sample PCB boards
- 3. Sample components
- 4. Solder paste and Flux
- 5. Calipers, microscope, screwdrivers, pliers, cutters, stencils, feeders, supporting pins, and other SMT tools

**Recommended Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA

# ESDM Courses

Level Code:  Vertical Name:

Course Code:  Course Name:

## Objective of the Course:

**Through Hole Assembly Operator:** Through hole assembly operator inserts electronic components for assembling the printed circuit board (PCB), as per the design, either manually or through automated machine

**Brief Job Description:** The individual on the job is responsible for manually fixing components using hand tools, operating and maintaining the automated insertion machine used for placing different types of components on the through-hole PCBs.

**Personal Attributes:** The job requires the individual to have: attention to details, good eyesight, and ability to work for long hours generally in a standing or sitting position

## Learning Outcomes:

### NOS # ELE/N5101 Perform through-hole assembly

1. Mount the prepared and binned components on the PCB manually
2. Operate the through-hole machine for automated assembling
3. Check visually after assembly is complete
4. Undertake preventive maintenance of the machine
5. Achieve productivity and quality standards

### NOS # ELE/N9919 Work with superiors and colleagues

1. Interact with supervisor or superior
2. Coordinate with colleagues

### ELE/N9920- Follow safety procedures

1. Understand potential sources of accidents
2. Use safety gear to avoid accidents
3. Understand the safety procedures followed by the company

## Expected Job Roles:

Duration of the Course (in hours)

Minimum Eligibility Criteria and pre-requisites, if any

**Professional Knowledge:**

**NOS # ELE/N5101 Perform through-hole assembly**

- KA1. company's policies on: incentives, delivery standards and personnel management and Intellectual Property Rights (IPR)
- KA2. work flow involved in assembly process of the company
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KA5. profile of clients
- KA6. component binning and stocking policy
- KA7. safety and quality standards followed in the organization

- KB1. basic electronics and component identification
- KB2. components and forming
- KB3. hand tools for manual assembly
- KB4. Through-hole insertion machine types and their functions and controls
- KB5. setting up, loading, basic programming of through-hole machine
- KB6. basic characteristics of through-hole and SMT components
- KB7. comparison between RoHS and Non-RoHS compliant solder
- KB8. basics of soldering and types of soldering such as dry and cold solder
- KB9. LEDs and mounting techniques
- KB10. Spike correction techniques along with ESD and high-voltage soldering for LEDs
- KB11. significance of junction temperature at PCB for light engine
- KB12. metal core sink assembly for LEDs
- KB13. colour codes and polarity of components
- KB14. regulation of operating speed and temperature of machine
- KB15. electro-static discharge (ESD) precautions
- KB16. manual soldering and rework of components
- KB17. handling the soldering iron, iron temperature, etc.
- KB18. basics of wave soldering such as flux and their types, pre-heat conditions, wave profile
- KB19. typical soldering problems such as solder short, effect of quantity of solder or flux
- KB20. zero defect soldering
- KB21. lead cutting and component lifting
- KB22. PCB design basics
- KB23. commonly occurring machine problems
- KB24. IPC standards for PCBs

**NOS # ELE/N9919 Work with superiors and colleagues**

- KA1. company's policies on: incentives, delivery standards, and personnel management

KA2. work flow involved in company's process  
KA3. importance of the individual's role in the workflow  
KA4. reporting structure

KB1. how to communicate effectively  
KB2. how to build team coordination

**NOS # ELE/N9920 Interact with co-workers**

KA1. company's policies on handling: harmful chemicals and sharp tools, safety and hazards of machines, fire safety/drill, first aid and, disposal of harmful chemicals and materials, quality standards

KA2. company occupational safety and health policy followed

KA3. company emergency evacuation procedure

KA4. company's medical policy

KB1. how to maintain the work area safe and secure

KB2. how to handle hazardous material

KB3. how to follow safety procedures while operating hazardous tools and equipment

KB4. emergency procedures to be followed such as fire accidents and fire safety education

KB5. how to use machines and tools without causing bodily harm

KB6. first aid execution

KB7. disposal of hazardous chemicals, tools and materials by following prescribed environmental norms or as per company policy

**Professional Skill:**

- i. **Decision making**
- ii. **Reflective thinking**
- iii. **Using tools and machines**
- iv. **Analytical and reflective skills**
- v. **Critical thinking**
- vi. **Handling safety equipment**

**Core Skill:**

1. Reading and Writing Skills
2. Team work
3. Multitasking
4. Communication Skills

**Detailed Syllabus of Course**

Module. No	Module. Name	Minimum No. of Hours
	Perform through-hole assembly	
	Work with superiors and colleagues	
	Interact with co-workers	
<b>Total Theory / Lecture Hours:</b>		175
<b>Total Practical / Tutorial Hours:</b>		225
<b>Total Hours:</b>		400

**Recommended Hardware:**

**Recommended Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA



## ESDM Courses

Level Code:  Vertical Name:

Course Code:  Course Name:

### Objective of the Course:

**Circuit Imaging Operator:** Also known as 'Photo Imaging Operator', the Circuit Imaging Operator imprints the circuit design layout on the laminated printed circuit board (PCB) with ultraviolet (UV) light exposure.

**Brief Job Description:** The individual at work places the circuit design layout printed on a 'positive' translucent film on the laminated and photo-sensitive PCB panel and exposes it to UV light, thereby curing the photo-resist under the clear portions of the film in order to get the circuit printed onto the panel.

**Personal Attributes:** The job requires the individual to have: attention to details, hand-eye coordination, appreciation for accuracy, ability to lift heavy panels and orientation towards work safely

### Learning Outcomes:

#### NOS # ELE/N2201 Imprint circuit layout on PCB panel

1. Clean the PCB panels and prepare for UV exposure
2. Set up the machine and laminate dry film rolls on the panel
3. Expose the laminated panel to UV light
4. Develop the circuit image on the panel
5. Undertake preventive maintenance of the machines
6. Achieve productivity and quality standards

#### NOS # ELE/N9917 Interact with superiors and colleagues

1. Interact with supervisor or superior
2. Coordinate with colleagues

#### ELE/N9918- Follow safety standards

1. Understand potential sources of accidents
2. Use safety gear to avoid accidents
3. Understand the safety procedures followed by the company

### Expected Job Roles:

Circuit Imaging Operator

Duration of the Course (in

hours)

**Minimum Eligibility Criteria and pre-requisites, if any**

10<sup>th</sup> pass

**Professional Knowledge:**

**NOS # ELE/N2201 Imprint circuit layout on PCB panel**

- KA1. company's policies on: incentives, delivery standards and personnel management and IPR
- KA2. PCB manufacturing process of the organization
- KA3. importance of the individual's role in the workflow
- KA4. organizational capabilities with respect to input materials/processes
- KA5. reporting structure and be clear about the hierarchy
- KA6. documentation procedures
- KA7. safety and quality standards followed in the organization
  
- KB1. basic electronics and circuit design layouting
- KB2. UV, photo resist, light exposure time and intensity, vacuum, alignment and their importance in the circuit imaging process
- KB3. operation and maintenance of machines such as laminator, imaging and developing machines
- KB4. circuit imaging process including surface preparation, lamination, exposure, cooling and developing
- KB5. photo tools, i.e, negatives or positives, development of the UV cured circuit, chemicals used for developing, etc.
- KB6. different types of imaging processes other than ultraviolet exposure and their uses
- KB7. different types of films and chemicals used in imaging and their purpose
- KB8. manual and automated exposure machines and standard procedures
- KB9. dry film resist (DFR) lamination and development including process parameters, chemicals, calibration, exposure time, etc.
- KB10. probable defects in imaging process
- KB11. environment and safety norms to follow
- KB12. defects in machines and remedies with causes
- KB13. IPC standards for printed circuit boards

**NOS # ELE/N9917 Interact with superiors and colleagues**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. work flow involved in company's process
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure

- KB1. how to communicate effectively
- KB2. how to build team coordination

**NOS # ELE/N9918 - Follow safety standards**

- KA1. company's policies on handling: harmful chemicals and sharp tools, safety and hazards of machines, fire safety/drill, first aid and, disposal of harmful chemicals and materials, quality standards

KA2. company occupational safety and health policy followed  
 KA3. company emergency evacuation procedure  
 KA4. company's medical policy

KB1. how to maintain the work area safe and secure  
 KB2. how to handle hazardous material  
 KB3. how to follow safety procedures while operating hazardous tools and equipment  
 KB4. emergency procedures to be followed such as fire accidents and fire safety education  
 KB5. how to use machines and tools without causing bodily harm  
 KB6. first aid execution  
 KB7. disposal of hazardous chemicals, tools and materials by following prescribed environmental norms or as per company policy

**Professional Skill:**

- i. **Reflective Thinking**
- ii. **Operating Machines and Material Handling**
- iii. **Problem solving**
- iv. **Critical Thinking**
- v. **Decision Making**
- vi. **Handling Safety Equipment**

**Core Skill:**

- 1. **Reading and Writing Skills**
- 2. **Team work**
- 3. **Communication skills**
- 4. **Multitasking**

**Detailed Syllabus of Course**

<b>Module. No</b>	<b>Module. Name</b>	<b>Minimum No. of Hours</b>
	Imprint circuit layout on PCB panel	
	Interact with superiors and colleagues	
	Follow safety standards	

<b>Total Theory / Lecture Hours:</b>	150
<b>Total Practical / Tutorial Hours:</b>	200
<b>Total Hours:</b>	350

**Recommended Hardware:**

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**Recommended Software:**

NA
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**Text Books:**

NA
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**Reference Books:**

NA
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## ESDM Courses

Level Code:  Vertical Name:

Course Code:  Course Name:

### Objective of the Course:

To train the person who is responsible for wiring all components present within the panel as per specifications provided by the design engineering team.

### Learning Outcomes:

#### **NOS # ELE/N7302 Wire control panel:**

1. Understand work requirement from the supervisor
2. Wire the control panel
3. Report problems to supervisor
4. Achieve productivity, quality and safety standards as per company's norms

#### **NOS # ELE/N9962 - Interact with other employees**

1. Interact with supervisor or superior
2. Coordinate with colleagues

#### **ELE/N9963 Maintain safe work surroundings**

1. Follow standard safety procedures of the company
2. Participate in company's safety and fire drills
3. Maintain good posture at work for long term health

### Expected Job Roles:

Wireman Control panel

Duration of the Course (in hours)

**Minimum Eligibility Criteria and pre-requisites, if any**

8<sup>th</sup> Pass

**Professional Knowledge:**

**NOS # ELE/N7302- wire control panel**

- KA1. company's policies on: incentives, delivery standards and personnel management
- KA2. reporting and documentation processes
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KB1. electro-mechanical assembly and wiring instructions
- KB2. hazards associated with panel assembly and wiring and how to avoid them
- KB3. general principles of wiring and assembly
- KB4. insulation stripping, securing of cables and wires, cable routing, cable forming or bending, colour coding wires and cables
- KB5. types of cables such as single and multi-core fibre optic cables, etc.
- KB6. types of components and sub-assemblies used in the panel assembly process
- KB7. preparations and precautions to be taken on the components and the panel before assembly process
- KB8. basics of automation and electro mechanical control systems
- KB9. regulations applicable during selection of wiring/cabling
- KB10. methods of attaching labels, warning signs on the panel
- KB11. operation of PLCs, relays, contactors, circuit breakers, solenoids, actuators, controllers, etc.
- KB12. motors, generators, starters and their controls
- KB13. safety norms in handling electrical/electronic components and electrostatic discharge
- KB14. customer safety requirements for all projects being implemented and other applicable safety standards
- KB15. ISO standards and procedures applicable for assembly activities
- KB16. fundamentals of electricity such as Ohms law, difference between AC and DC, series and parallel connections
- KB17. components such as diode, transformer, LED, transistor, capacitor, resistor, inductor, thermistor, IC
- KB18. how to read values, colour coding, polarity, orientation, tolerance
- KB19. specific safety precautions while working in an electronic assembly unit
- KB20. protective gear such as goggles, gloves, rubber shoes, etc.
- KB21. selection and maintenance of various tools used during the assembly process
- KB22. frequently occurring errors, causes and preventive measures
- KB23. work place norms such as 5S and Kaizen

**ELE/N9962 interact with co-workers**

- KA2. importance of the individual's role in the workflow
- KA3. reporting structure
- KB1. how to communicate effectively
- KB2. how to build team coordination

**ELE/N9963 Maintain safe work surrounding**

- KA2. company occupational safety and health policy followed
- KA3. company emergency evacuation procedure
- KA4. company's medical policy
- KB1. how to maintain the work area safe and secure
- KB2. how to handle hazardous materials, tools and equipment
- KB3. Emergency procedures to be followed such as fire accidents, etc.

KB4. long term value of good posture and use of appropriate handling equipment

**Professional Skill:**

1. Interpersonal skills
2. Communication skills
3. Behavioural skills
4. Reading, writing and computer skills
5. Teamwork and multitasking
6. Documentation Skills
7. Reflective thinking
8. Critical Thinking
9. Decision Making

**Core Skill:**

1. Electro-mechanical assembling skills
2. Using tools and machines
3. Interpersonal skills
4. Analytical and reflective skills

**Detailed Syllabus of Course**

Module. No	Module. Name	Minimum No. of Hours
	As per the NOSs listed in the Qualification pack	
<b>Total Theory / Lecture Hours:</b>		75
<b>Total Practical / Tutorial Hours:</b>		125
<b>Total Hours:</b>		200

**Recommended Hardware:**

1. Different type of Control panels
2. Screw driver, ratchets, spring driver, speciality wrenches, inspection fixtures, wire cutter, pliers, tester, spanner, hammer, hand bender, ladder, knife, voltmeter, ammeter, wattmeter, MEGGER

**Recommended Software:**

NA
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**Text Books:**

NA
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**Reference Books:**

NA
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## ESDM Courses

**Level Code:** L4 **Vertical Name:** 2.7 LED & Photovoltaic

**Course Code:** EL/M/L4/C018 **Course Name:** 2.7.1 Certificate Course in LED Light Mechanical Assembly

### Objective of the Course:

To train & teach individuals how to assemble different electronics, electrical and mechanical parts and connect them to make the final LED luminary to complete the product.

### Learning Outcomes:

After completing the training, one will be able to complete the heat sink assembly, complete base assembly, join base assembly with heat sink assembly, fix glass shell and pack final product as per LED Assembly quality standard.

### Expected Job Roles:

LED Light Mechanical Assembly Operator

**Duration of the Course (in hours)**

250 Hrs

**Minimum Eligibility Criteria and pre-requisites, if any**

12<sup>th</sup> Pass

### Professional Knowledge:

1. The operation and significance of various electronic, electrical and mechanical components of LED luminary.
2. LED product design basics and significance of optics.
3. LED Technical Basics, array configuration, thermal management,
4. How to handle LEDs and PCBs during assembly and packaging.
5. Ingress protection rating requirement for different LED Lighting products.
6. Special ESD and work safety precautions to be taken during assembling.
7. 5S standards (Sorting, setting, shining, standardise, sustain).
8. LED Driver selection
9. Safety and environmental norms to be followed

### Professional Skills:

1. To plan for receiving the material for assembly, keeping them at work station to assemble luminaries in minimum possible time.
2. To operate screw driver, allen key set, wire stripper, soldering station, potting machine, press, weighting machine.
3. To use magnifying lens for visual inspection.
4. To use tools necessary for packaging of LED luminaries.
5. To use multimeter, DC power source, power analyser.
6. Ability to understand standard operating procedures and processes related to product assembly.
7. To identify defects in input raw materials.
8. To spot process disruptions and delays in processes
9. Ability to improve work processes
10. To troubleshoot and reduce machine down time

**Core Skills:**

0. Able to read company's SOP and work instructions.
1. Able to maintain day to day operational records as per company policy.
2. To maintain pace of the throughput as per production requirement.
3. To effectively communicate with supervisor about work requirements.
4. To be able to write reports in log books.
5. To co-ordinate with other team members in order to collect inputs and deliver output to the next process
6. To share knowledge with team members for smooth work flow.
7. To work as a team to meet the daily target of LED luminary assembly.

**Detailed Syllabus of Course**

Module. No	Module. Name	Minimum No. of Hours
1	Awareness electronics components, pick & place process, reflow soldering, wave soldering and manual soldering.  LED Basics: CCT, CRI, Operating voltage & Current, Thermal Management, Array configuration.	36 Hours
2	All the aspects related to LED Luminary assembly.  LED Driver Selection	72 Hours
3	Importance of thermal simulation and introduction to thermal simulation software.  ESD prevention with respect to LED and LED product safety.  Importance of 5S on productivity & Management	21 Hours
4	Importance of better communication, co-ordination and maintaining good relationship among co-workers.  Understand Safety procedure followed by the company & preventive	21 Hours

	measures taken to prevent accidents.	
5	Internship / Practical	100 Hrs
	Total	250 Hrs

**Total Course Theory / Lecture Hours: 65**

**Total Course Practical / Tutorial Hours: 185**

**Total Course Hours: 250**

(Training in 100 hrs of Communicative English and 80 hrs of Basic IT Skills also provided, as required)

**Recommended Hardware:**

Assembly Equipments, tools and test equipment required for LED Light Mechanical Assembly

**Recommended Software:**

Nil

**Text Books:**

Students and Faculty Guides prepared by ASAP in association with the Training Service Providers and industries.

**Reference Books:**

**Evaluation criteria:**

**Training is Provided by Sahasra Sambhav Pvt. LTD Noida.  
Assessment and Evaluation by ESSCI**

# ESDM Courses

Level Code:

L4

Vertical Name:

LED Lighting

Course Code:

EL/M/L4/C016

Course Name:

2.7.2 LED Mechanical Assembly Operator

## Objective of the Course:

**Mechanical Assembly Operator:** The Mechanical Assembly Operator assembles all parts of LED luminary to complete the product.

**Brief Job Description:** The individual at work fits together different electronic, electrical and mechanical parts and connects them to make the final LED luminary as per product design.

**Personal Attributes:** The job requires the individual to have: attention to details, safety and hazards orientation, willingness to wear protective gears and the stamina for long hours of work.

## Learning Outcomes:

### NOS # ELE/9201 Assemble LED Luminary

1. Complete base assembly
2. Complete heat sink assembly
3. Join base assembly with heat sink assembly
4. Fix glass shell and pack the final product
5. Achieve productivity and quality of standards
- 6.

### NOS # ELE/N9919 Work with superiors and colleagues

1. Interact with supervisor or superior
2. Coordinate with colleagues

### ELE/N9921- Follow safety standards

1. Understand potential sources of accidents
2. Use safety gear to avoid accidents
3. Understand the safety procedures followed by the company

### Entrepreneurship

## Expected Job Roles:

LED Mechanical Assembly Operator

Duration of the Course (in hours)

350 hours

**Minimum Eligibility Criteria  
and pre-requisites, if any**

10<sup>th</sup> + ITI, 12<sup>th</sup> Pass, Other non-Science graduates

**Professional Knowledge:**

**NOS # ELE/9201 Assemble LED Luminary**

- KA1. company's policies on: incentives, delivery standards and personnel management
- KA2. company's standard operating procedures and processes related to product assembly
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KA5. safety and quality standards followed in the organization

- KB1. the operation and significance of various electronic, electrical and mechanical components of LED luminary
- KB2. product designing basics and significance of optics
- KB3. how to handle LEDs and PCBs during assembly and packaging
- KB4. IP rating and CREE standards
- KB5. special ESD and work safety precautions to be taken during assembling
- KB6. 5S standards (sorting, setting, standardise, sustain, shining)

**NOS # ELE/N9919 Work with superiors and colleagues**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. work flow involved in company's process
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
  
- KB1. how to communicate effectively
- KB2. how to build team coordination

**NOS # ELE/N9921 - Follow safety standards**

- KA1. company's policies on handling: harmful chemicals and sharp tools, safety and hazards of machines, fire safety/drill, first aid and, disposal of harmful chemicals and materials, quality standards
- KA2. company occupational safety and health policy followed
- KA3. company emergency evacuation procedure
- KA4. company's medical policy
  
- KB1. how to maintain the work area safe and secure
- KB2. how to handle hazardous material
- KB3. how to follow safety procedures while operating hazardous tools and equipment
- KB4. emergency procedures to be followed such as fire accidents and fire safety education
- KB5. how to use machines and tools without causing bodily harm
- KB6. first aid execution
- KB7. disposal of hazardous chemicals, tools and materials by following prescribed environmental norms or as per company policy

**Professional Skill:**

- i. **Planning**
- ii. **Using tools**
- iii. **Problem solving**
- iv. **Reflective thinking**
- v. **Critical Thinking**
- vi. **Decision Making**
- vii. **Handling Safety Equipment**

**Core Skill:**

- 1. **Reading and Writing Skills**
- 2. **Team work**
- 3. **Communication skills**
- 4. **Multitasking**

**Detailed Syllabus of Course**

<b>Module. No</b>	<b>Module. Name</b>	<b>Minimum No. of Hours</b>
	Assemble LED Luminary	
	Work with superiors and colleagues	
	Follow safety standards	
<b>Total Theory / Lecture Hours:</b>		150
<b>Total Practical / Tutorial Hours:</b>		200
<b>Total Hours:</b>		350

**Recommended Hardware:**

**Recommended Software:**

NA

**Text Books:**

NA

**Reference Books:**

NA

2.8 Electronic Security

**ESDM Courses**

**Level Code:**

4

**Vertical Name:**

Electronic Security

**Course Code:**

EL/S/L4/C019

**Course Name:**

2.8.1 Installation technician of Electronic Security Systems

## Objective of the Course:

**Brief Job Description:** Understanding the customer's requirements for installing the various types of electronic security systems and configuring the system for security functions

## Learning Outcomes:

### **NOS # ELE/N4616 Engage with customer for installation**

- Interact with the customer
- Understand their requirements
- Visit the site
- Understand the site condition and requirement
- Suggest possible solutions
- Decide on the system to be installed
- Achieve productivity and quality standards

### **NOS # ELE/N4617 Install and setup the access control system**

- Procure the hardware required for installation
- Test the access control hardware before installation
- Install the wiring
- Install and setup the access controls
- Setup the system
- Use appropriate tools and equipment for installation

### **NOS # ELE/N4610IDS Install Intrusion Detection System**

- Procure the hardware required for installation.
- Test the hardware before installation.
- Connect the cables.
- Install and setup the IDS.
- Use appropriate tools and equipments for installation.
- Achieve productivity and quality standards.

### **NOS # ELE/N4611IDS Setup IDS**

- Procure the hardware required for installation.
- Test the hardware before installation.
- Connect the cables.
- Install and setup the IDS.
- Use appropriate tools and equipments for installation.
- Achieve productivity and quality standards.



**NOS # ELE/N4610 Install CCTV camera**

- Procure the hardware required for installation
- Test the hardware before installation
- Connect the cables
- Install and setup the camera
- Use appropriate tools and equipments for installation
- Achieve productivity and quality standards

**NOS# ELE/N4611 Setup CCTV surveillance system**

- Connect CCTV camera and DVR with the system
- Setup the CCTV system
- Ensure system functioning and perform a demo
- Complete the installation task and report
- Interact with customer
- Interact with superior
- Achieve productivity and quality as per company's norms

**NOS# ELE/N4610FAS Install FAS detector**

- Procure the hardware required for installation.
- Test the hardware before installation.
- Connect the cables.
- Install and setup the detectors, devices & Control Panels.
- Use appropriate tools and equipments for installation.
- Achieve productivity and quality standards.

**NOS #ELE/N4611FAS Setup FAS**

- Connect FAS detectors and devices with the Fire Alarm Control Panel.
- Setup the Fire Alarm System.
- Ensure system functioning and perform a demo.
- Complete the installation task and report.
- Interact with customer.
- Interact with superior.
- Achieve productivity and quality as per company's norms.

**NOS # ELE/N4610 Install VDP Outdoor Unit and lock**

- Procure the hardware required for installation
- Test the hardware before installation
- Connect the cables
- Install and setup the indoor and outdoor units.
- Use appropriate tools and equipments for installation
- Achieve productivity and quality standards

**NOS # ELE/N4611 Setup VDP Indoor system**

- Connect outdoor units and lock with the Indoor unit

- Setup the Video Door Phone system
- Ensure system functioning and perform a demo
- Complete the installation task and report
- Interact with customer
- Interact with superior
- Achieve productivity and quality as per company's norms

**NOS # ELE/N0009 Coordinate with colleagues**

- Interact with supervisor or superior
- Coordinate with colleagues

**Expected Job Roles:**

Installation technician of Electronic Security Systems

**Duration of the Course  
(in hours)**

350 Hrs

**Minimum Eligibility  
Criteria and pre-  
requisites, if any**

Minimum educational qualification: 10<sup>th</sup> + ITI /12<sup>th</sup> pass /other non-science graduates.

**Professional Knowledge:**

**NOS # ELE/N4616 Engage with customer for installation**

- KA1. company's policies on: customer care, warranties, products
- KA2. company's code of conduct
- KA3. organisation culture and typical customer profile
- KA4. company's reporting structure
- KA5. company's documentation policy
- KA6. company's service level agreements and policies
- KB1. Installation requirement in terms of equipment, system , tools, applications appropriate for a particular site
- KB2. preparation of field and site for installation
- KB3. design criteria for installation
- KB4. location criteria for installation
- KB5. different types of equipments in the market, their specifications and prices
- KB6. different types of and associated systems
- KB7. different types of and their purposes
- KB8. tools and equipment to carry for installations
- KB9. precautions to be taken while handling field calls and dealing with customers
- KB10. relevant reference sheets, manuals and documents to carry in the field

**NOS # ELE/N4617 Install and setup the access control system**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. company's sales and after sales support policy

- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KA5. company's policy on product's warranty and other terms and conditions
- KA6. company's line of business and product portfolio
- KA7. company's customer support and service policy
- KB1. basic electronics involved in the hardware
- KB2. basic electrical and wiring techniques
- KB3. different types of access control products and functionalities
- KB4. functions of electrical and mechanical parts/ modules
- KB5. typical customer profile
- KB6. dismantling and assembling of hardware equipment
- KB7. access control system concepts such as for master controller, card reader, door control units, smart-hub, etc.
- KB8. company's portfolio of products and that of competitors
- KB9. installation procedures given in the manuals
- KB10. specification and the procedures to be followed for setting up the system
- KB11. different type of cables used for data transmission and power transmission
- KB12. power requirement of hardware
- KB13. different types of access controls hardware available in the market
- KB14. software requirement associated with access controls
- KB15. computing system and operating system requirements for access control system installation
- KB16. voltage and power requirement for different hardware devices
- KB17. how to operate the system and other hardware
- KB18. all safety rules, policies and procedures
- KB19. quality standards to be followed

**NOS # ELE/N4610IDS Install Intrusion Detection System**

- KA1. company's policies on: incentives, delivery standards, and personnel Management.
- KA2. company's sales and after sales support policy.
- KA3. importance of the individual's role in the workflow.
- KA4. reporting structure.
- KA5. company's policy on product's warranty and other terms and conditions.
- KA6. company's line of business and product portfolio.
- KA7. company's customer support and service policy.
- KB1. basic electronics involved in the hardware.
- KB2. basic electrical and wiring.
- KB3. different types of electronic Intrusion Detection and Alarm products and their Functionalities.
- KB4. functions of electrical and mechanical parts or modules.
- KB5. typical customer profile.
- KB6. elements of IDS systems such as IDS sensors, IDS panel. Kb 7 company's portfolio of products and that of competitors.
- KB8. installation procedures given in the manuals.
- KB9. specification and the procedures to be followed for setting up the system. KB10. different type of cables used for data transmission and power transmission for a wired system.
- KB11. power requirement of different IDS related equipment.

- KB12. different types of IDS sensors available in the market.
- KB13. IDS sensor specifications such as sensitivity, threshold, etc.
- KB14. controls of different options in IDS sensors such as NO, NC Sensors.
- KB15. voltage and power requirement for different hardware devices.
- KB16. how to operate the system and other hardware.
- KB17. safety rules, policies and procedures
- KB18. quality standards to be followed

**NOS # ELE/N4611IDS Setup IDS**

- KA1. company's policies on: incentives, delivery standards, and personnel management.
- KA2. company's sales and after sales support policy.
- KA3. importance of the individual's role in the workflow.
- KA4. reporting structure.
- KA5. company's policy on product's warranty and other terms and conditions.
- KA6. company's line of business and product portfolio
- KB1. different types of electronic IDS products and functionalities.
- KB2. functions of electrical and mechanical parts/ modules.
- KB3. specification and the procedures to be followed for setting up the system. KB4. different type of cables used for data transmission and power transmission.
- KB5. different types IDS related equipment, different types of IDS Sensor, and Panels available in the market
- KB6. IDS Sensor and Panels Specifications, such as, Sensitivity, Area of Coverage, etc.
- KB7. controls of different options in IDS Panels.
- KB8. voltage and power requirement for different hardware devices.
- KB9. integration of hardware to setup the system.
- KB10. parameters and specification for different types of system integration.
- KB11. accessing IDS from remote locations.
- KB12. IDS monitoring and control.
- KB13. technology and networking principles.
- KB14. basics of wireless Technology.
- KB15. controls in IDS Panel and their usage.
- KB16. how to operate the system and other hardware. KB17. safety rules, policies and procedures.
- KB18. quality standards to be followed.

**NOS # ELE/N4610 Install CCTV camera**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. company's sales and after sales support policy
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KA5. company's policy on product's warranty and other terms and conditions
- KA6. company's line of business and product portfolio
- KA7. company's customer support and service policy
- KB1. basic electronics involved in the hardware
- KB2. basic electrical and wiring
- KB3. different types of electronic surveillance products and functionalities
- KB4. functions of electrical and mechanical parts or modules
- KB5. typical customer profile
- KB6. elements of CCTV systems such as camera, DVR, monitor
- KB7. company's portfolio of products and that of competitors

- KB8. installation procedures given in the manuals
- KB9. specification and the procedures to be followed for setting up the system
- KB10. different type of cables used for data transmission and power transmission
- KB11. power requirement of different CCTV related equipment
- KB12. video recording of footage – analog and digital
- KB13. different types of camera available in the market
- KB14. camera specifications such as focus, lens type, zoom
- KB15. controls of different options in camera such as rotation, speed of movement in pan / tilt camera
- KB16. voltage and power requirement for different hardware
- KB17. how to operate the system and other hardware
- KB18. safety rules, policies and procedures
- KB19. quality standards to be followed

**NOS # ELE/N4611 Setup CCTV surveillance system**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. company's sales and after sales support policy
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KA5. company's policy on product's warranty and other terms and conditions
- KA6. company's line of business and product portfolio
- KB1. different types of electronic surveillance products and functionalities
- KB2. functions of electrical and mechanical parts/ modules
- KB3. specification and the procedures to be followed for setting up the system
- KB4. different type of cables used for data transmission and power transmission
- KB5. power requirement of different CCTV related equipment
- KB6. video recording of footage – analog and digital
- KB7. different types of camera available in the market
- KB8. camera specifications such as focus, lens type, zoom
- KB9. controls of different options in camera such as rotation, speed of movement in pan / tilt camera
- KB10. voltage and power requirement for different hardware devices
- KB11. integration of hardware to setup the system
- KB12. parameters and specification for different types of system integration
- KB13. accessing image from remote locations
- KB14. CCTV monitoring and control over IP network / Internet
- KB15. IP technology and networking principles
- KB16. basics of networking
- KB17. video recording technologies
- KB18. controls in digital video recorder and their usage
- KB19. how to operate the system and other hardware
- KB20. safety rules, policies and procedures
- KB21. quality standards to be followed

**NOS # ELE/N4610FAS Install FAS detector**

- KA1. company's policies on: incentives, delivery standards, and personnel Management.
- KA2. company's sales and after sales support policy.
- KA3. importance of the individual's role in the workflow.
- KA4. reporting structure.
- KA5. company's policy on product's warranty and other terms and conditions.
- KA6. company's line of business and product portfolio.
- KA7. company's customer support and service policy
- KB1. basic electronics involved in the FAS hardware.
- KB2. basic electrical and wiring.
- KB 3. Functioning of Fire Alarm System.
- KB4. different types of electronic detection equipment and their functionalities.
- KB5. Conventional and Addressable Fire Alarm Systems.
- KB6. Elements of FAS systems such as Detector, Fire Panel, Sounder, Control Module, Monitor Module, etc.
- KB7. company's portfolio of products and that of competitors. KB8. installation procedures given in the manuals.
- KB9. specification and the procedures to be followed for setting up the system. KB10. different type of cables used for FAS.
- KB11. power requirement of FAS Equipment.
- KB12. different types of detectors and devices available in the market.
- KB13. detector specifications such as smoke, heat, Rate of-rise or flame detector.
- KB14. Installation of detectors & devices and assigning addresses to them.
- KB15. how to operate hardware and the complete system.
- KB16. safety rules, policies and procedures.
- KB17. Various Quality Standards and Certifications, such as, UL, FM, NFPA, etc.
- KB18. Integration with other Systems

**NOS # ELE/N4611FAS Setup FAS**

- KB11. power requirement of FAS Equipment.
- KB12. different types of detectors and devices available in the market.
- KB13. detector specifications such as smoke, heat, Rate of-rise or flame detector.
- KB14. Installation of detectors & devices and assigning addresses to them.
- KB15. how to operate hardware and the complete system.
- KB16. safety rules, policies and procedures.
- KB17. Various Quality Standards and Certifications, such as, UL, FM, NFPA, etc.
- KB18. Integration with other Systems.

**NOS # ELE/N4610 Install VDP Outdoor Unit and lock**

- KA1. company's policies on: incentives, delivery standards, and personnel management

- KA2. company's sales and after sales support policy
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KA5. company's policy on product's warranty and other terms and conditions
- KA6. company's line of business and product portfolio
- KA7. company's customer support and service policy
- KB1. basic electronics involved in the hardware
- KB2. basic electrical and wiring
- KB3. different types of electronic surveillance products and functionalities
- KB4. functions of electrical and mechanical parts or modules
- KB5. typical customer profile
- KB6. Elements of VDP systems such as indoor units, outdoor units, locks
- KB7. company's portfolio of products and that of competitors KB8. installation procedures given in the manuals
- KB9. specification and the procedures to be followed for setting up the system KB10. different type of cables used for data transmission and power transmission KB11. power requirement of different VDP related equipment
- KB12. VDP system– coloured and monochrome
- KB13. different types of VDP systems available in the market
- KB14. VDP specifications such number of indoor systems and outdoor systems
- KB15. options in connection of locks , number of indoor
- KB16. voltage and power requirement for different hardware devices
- KB17. how to operate the system and other hardware
- KB18. safety rules, policies and procedures
- KB19. quality standards to be followed

**NOS # ELE/N4611 Setup VDP Indoor system**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. company's sales and after sales support policy
- KA3. importance of the individual's role in the workflow
- KA4. reporting structure
- KA5. company's policy on product's warranty and other terms and conditions
- KA6. company's line of business and product portfolio
- KB1. different types of electronic surveillance products and functionalities
- KB2. functions of electrical and mechanical parts/ modules
- KB3. specification and the procedures to be followed for setting up the system KB4. different type of cables used for data transmission and power transmission KB5. power requirement of different VDP related equipment
- KB6. VDP system – colour or monochrome system.
- KB7. different types of VDP systems available in the market
- KB8. specifications such as light condition, vandal proof, IR
- KB9. different options in outdoor units like IR, hard plastic, tamper proof
- KB10. voltage and power requirement for different hardware devices
- KB11. integration of hardware to setup the system
- KB12. parameters and specification for different types of system integration

- KB13. accessing input or output from remote locations
- KB14. VDP and control from indoor unit
- KB15. Technologies used in VDP
- KB16. how to operate the system and other hardware
- KB17. safety rules, policies and procedures
- KB18. quality standards to be followed

**NOS # ELE/N0009 Coordinate with colleagues**

- KA1. company's policies on: incentives, delivery standards, and personnel management
- KA2. importance of the individual's role in the workflow
- KA3. reporting structure
- KB1. how to communicate effectively
- KB2. how to build team coordination

**Professional Skill:**

- xviii. **Interpersonal skills**
- xix. **Behavioural skills**
- xx. **Reflective thinking**
- xxi. **Critical Thinking**
- xxii. **Decision Making**
- xxiii. **Using tools and machines**

**Core Skill:**

- 9. Using tools and machines
- 10. Reading, writing and computer skills
- 11. Teamwork and multitasking
- 12. Communication skills

**Detailed Syllabus of Course:**

S.No.	Module. Name	Duration
1	<ul style="list-style-type: none"> <li>• Engage with customer for installation</li> </ul>	
2	<ul style="list-style-type: none"> <li>• Install and setup the access control system</li> </ul>	
3	<ul style="list-style-type: none"> <li>• Install Intrusion Detection System</li> </ul>	
4	<ul style="list-style-type: none"> <li>• IDS Setup IDS</li> </ul>	



5	• Install CCTV camera	
6	• Setup CCTV surveillance system	
7	• FAS Install FAS detector	
8	• FAS Setup FAS	
9	• Install VDP Outdoor Unit and lock	
10	• Setup VDP Indoor system	
11	• Coordinate with colleagues	
	<b>Total Theory/Lecture</b>	150 Hrs
	<b>Total Practical / Tutorial Hours:</b>	200 Hrs
	<b>Total Hours:</b>	350 Hrs

**Recommended Hardware:**

Different types of CCTV, Access control system

**Recommended Software:**

**Text Books:**

**Reference Books:**

### 3. National Institute of Electronics and Information Technology

#### 3.1 Consumer Electronics

## ESDM Courses

**Level Code:** L4 **Vertical Name:** 3.1 Consumer Electronics

**Course ID:** NL/S/L4/C007 **Course Name:** 3.1.1 Diploma in Installation & Repair of Consumer Electronics Products

### Objective of the Course:

Objective of this course is to give knowledge and competencies regarding Installation, Servicing, Repair, Fault Diagnosis and Error Remover for Consumer Electronics Product like LCD-LED TV and Monitor, Cable TV and DTH Services, Induction Stove etc.

### Learning Outcomes:

After successful completion of this course, participant will be acquainted with the necessary Hardware and Software skills for Installation, Repair, Maintenance and Trouble shooting of Consumer Electronics Product. Participants will be a "Ready to Observe" product for Consumer Electronics Product manufacturing sector or may be self-employed.

### Expected Job Roles:

Participants Job Role includes

- Support Technician for Multi-National and National Desktop PCs Manufacturers
- Can Work In Call Centre for After Sale Support
- can be also absorbed in Local Markets
- Can start their own Small Scale business and can be self employed

**Duration of the Course (in hours)** 350 Hours

**Minimum Eligibility Criteria and pre-requisites, if any** ITI or 12<sup>th</sup> pass

