Syllabiof Courses

for

Skill Development in ESDM sector

Under the "Scheme for Financial assistance to select six (06) States/Utsfor Skill Development in ESDM sector"

of

Department of Electronics and Information Technology

Ministry of Communications & Information Technology,
Government of India

Submitted by

ELECTRONICS SECTOR SKILLS COUNCIL OF INDIA

1. Consumer Electronics

ESDM Courses

Level Code:	III	**Vertical Name:**	Consumer Electronics
Course Code:	ELE/Q3102	**Course Name:**	1.1 Field Technician – Air conditioner

Objective of the Course:

To train the person, whoinstalls 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

Entrepreneurship

Expected Job Roles:

Filed Technician – Air Conditioner

Duration of the Course (in hours)	350 hours
Minimum Eligibility Criteria and pre-requisites, if any	10^{th} Pass

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, thermisters)
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	
	Total Theory / Lecture Hours:	150
	Total Practical / Tutorial Hours:	200
	Total Hours:	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: IV **Vertical Name:** Consumer Electronics

Course Code: ELE/Q3105 **Course Name:** 1.2 Field Engineer - RACW

Objective of the Course:

To train the person, whointeracts 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

Entrepreneurship

Expected Job Roles:

Filed Engineer - RACW

Duration of the Course (in hours)	350 hours
Minimum Eligibility Criteria and pre-requisites, if any	12th Pass / ITI Pass

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	
	Total Theory / Lecture Hours:	150
	Total Practical / Tutorial Hours:	200
	Total Hours:	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

2. Communications Electronics

ESDM Courses

Level Code:	II	**Vertical Name:**	Communication Electronics

Course Code:	ELE/Q8101	**Course Name:**	1.3 DTH Set-top-box Installer and Service Technician

Objective of the Course:

To train the person whoinstalls 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)	200 hours

Minimum Eligibility Criteria and pre-requisites, if any	8th Standard Passed

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:

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

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

Recommended Hardware:

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

Recommended Software:	NA
Text Books:	NA
Reference Books:	NA

ESDM Courses

Level Code:	II	**Vertical Name:**	Communication Electronics
Course Code:	ELE/Q8102	**Course Name:**	1.4 DAS Set-top-box Installer and Service Technician

Objective of the Course:

To train the person whoinstalls 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)	200 hours
Minimum Eligibility Criteria and pre-requisites, if any	8th Standard Passed

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

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

3. IT Hardware

ESDM Courses

Level Code:	III	**Vertical Name:**	IT Hardware

Course Code:	ELE/Q4609	**Course Name:**	1.5 Installation Technician – Computing and Peripherals

Objective of the Course:

To train the person whois 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 hours)	350 hours
Minimum Eligibility Criteria and pre-requisites, if any	10th Standard 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

Module. No	**Module. Name**	**Minimum No. of Hours**
	As per the NOSs listed in the Qualification pack	
	Total Theory / Lecture Hours:	150
	Total Practical / Tutorial Hours:	200
	Total Hours:	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:	IV	**Vertical Name:**	IT Hardware

Course Code:	ELE/Q4601	**Course Name:**	1.6 Field Technician – Computing and Peripherals

Objective of the Course:

To train the person whois 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 firld 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^{th} pass / ITI 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

Module. No	Module. Name	Minimum No. of Hours
	As per the NOSs listed in the Qualification pack	
	Total Theory / Lecture Hours:	150
	Total Practical / Tutorial Hours:	200
	Total Hours:	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: V **Vertical Name:** IT Hardware

Course Code: ELE/Q4606 **Course Name:** 1.7 Field Technician – Networking and Storage

Objective of the Course:

To train the person whoresponsible 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

Entrepreneurship

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 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

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:

2. **Installation and Repair Skills**
3. **Hardware and Software operation skills**
4. **Networking, Servers and storage hardware related skills**
5. **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	
	Total Theory / Lecture Hours:	160
	Total Practical / Tutorial Hours:	240
	Total Hours:	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

4. Solar Electronics

ESDM Courses

Level Code:	IV	**Vertical Name:**	Solar Electronics

Course Code:	ELE/Q5901	**Course Name:**	5.1 Solar Panel Installation Technician

Objective of the Course:

To train the person, whochecks 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

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

Entrepreneurship

Expected Job Roles:

Solar Panel Installation Technician

Duration of the Course (in hours)	350 hours
Minimum Eligibility Criteria and pre-requisites, if any	10th Standard pass / ITI pass

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. **Communication skills**
ii. **Reading, writing and computer skills**
iii. **Teamwork and multitasking**
iv. **Reflective thinking**
v. **Analytical thinking**
vi. Critical Thinking
vii. **Decision Making**

Core Skill:

1. **Panel Installation Skills**
2. **Using Tools and Machines**
3. **Handling Safety Equipment**

Detailed Syllabus of Course

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

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
Text Books:	NA
Reference Books:	NA

PCB Assembly

ESDM Courses

Level Code: IV **Vertical Name:** PCB Assembly

Course Code: ELE/Q5202 **Course Name:** 5.2 Pick and Place Assembly Operator

Objective of the Course:

To train the person, whoprograms, 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	10^{th} pass / ITI pass

Professional Knowledge:

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 tecnique, 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 ocuring 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
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.	**Communication skills**
ii.	**Reading, writing and computer skills**
iii.	**Teamwork and multitasking**
iv.	**Reflective thinking**
v.	**Critical Thinking**
vi.	**Decision Making**

Core Skill:

1. **Operating Machines and Material Handling**
2. **Using Tools and Machines**
3. **Problem Solving & trouble shooting**
4. **Arithmetic and Geometry Skills**
5. **Handling Safety Equipment**

Detailed Syllabus of Course

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

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