

Model Curriculum

Field Engineer – RACW

SECTOR: ELECTRONICS
SUB-SECTOR: CONSUMER ELECTRONICS
OCCUPATION: AFTER SALES SERVICE
REF. ID: ELE/3105 VERSION 1.0
NSQF LEVEL: 5



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

ELECTRONICS SECTOR SKILLS COUNCIL OF INDIA

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **'Field Engineer – RACW'**
QP No. **'ELE/Q3105 NSQF Level 5'**

Date of Issuance: **December, 2015**

Valid up to: **March, 2016**

* Valid up to the next review date of the Qualification Pack



Authorised Signatory
(Electronics Sector Skills Council of India)

TABLE OF CONTENTS

1. Curriculum	01
2. Trainer Prerequisites	06
3. Annexure: Assessment Criteria	07

Field Engineer – RACW

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Field Engineer RACW”, in the “Electronics” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Field Engineer – RACW		
Qualification Pack Name & Reference ID.	Field Engineer – RACW ELE/Q3105		
Version No.	1.0	Version Update Date	2015-24-03
Pre-requisites to Training	8th Standard passed ITI/Diploma (Electrical/Mechanical/RAC)		
Training Outcomes	<ul style="list-style-type: none"> • Introduction and Safety Rules • Theory of RACW • Develop Communication Skills • Develop Soft Skills • Practical -Develop ability in repair of RACW and hands on Practical 		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of Field Engineer – RACW Qualification Pack issued by Electronic Sector Skill Council of India.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Introduction and Job Responsibilities</p> <p>Theory Duration (hh:mm) 08:00</p> <p>Practical Duration (hh:mm) 32:00</p> <p>Corresponding NOS Code ELE/N9901 / ELE/N3101</p>	<ul style="list-style-type: none"> • Introduction • Importance of RACW Trade, • Scope of job and Industry overview, • Safety Work Rules, • Safe work environment, • use of safety equipment, • Service precautions at workshop and at Customer's place 	N/A
2	<p>Measurement Systems</p> <p>Theory Duration (hh:mm) 08:00</p> <p>Practical Duration (hh:mm) 32:00</p> <p>Corresponding NOS Code ELE/N8107</p>	<ul style="list-style-type: none"> • Measurement Systems, CGS, MKS, FPS, SI Units, States of Matter, • Atomic Structure, Active , Passive Components, Conductors, insulator, Semi-Conductors, Resistance, Capacitance and Inductance, Series and Parallel circuits, • Ohm's law, • Kirchoff's Laws, • Electrical and Electronic symbols, • Transistors, Triacs, MOSFETs, AC, DC Circuits, • Earthing, Voltages, Work, Power and Energy, • Electrical Consumption, Watts, • Transformers, Motors- AC and DC, Transducers • Sensors, Switches, Pressure sensors, Valves, • Voltage Flow 	<p>Multi-meter</p> <p>Pressure Gauge</p> <p>Clamp Meter</p> <p>Weighing Scale</p> <p>Temperature meter</p>
3	<p>Attend to service complaints – washing machine</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 14:00</p>	<ul style="list-style-type: none"> • WM Types-Semi, Fully –Top Loading and front Loading, Uses, • Water Flow, Water Pressure, • Pulley, belt, solenoid, Clutch, Brake, • Timer and other parts and their uses in washing Machine, • Gears and Mechanism, Working Principle, Process –Wash, Soak, Rinse , Spin 	<p>Different types of Washing machine</p> <p>Multi-meter</p> <p>Pressure Gauge</p> <p>Clamp Meter</p> <p>Weighing Scale</p> <p>Temperature meter</p> <p>Spanner</p> <p>Screw Driver set</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Corresponding NOS Code ELE/N3116		
4	Attend to service complaints – Refrigerator Theory Duration (hh:mm) 06:00 Practical Duration (hh:mm) 14:00 Corresponding NOS Code ELE/N3115	<ul style="list-style-type: none"> Refrigeration- types , application , Vapour Compression, Main Components , Heat Exchanger, Heat Flow, Heat and temperature, various temperature scales, Concept of absolute zero, Conduction, Convection, Radiation, Specific, Latent and Sensible Heat, Pressure , Refrigeration Cycle, Types and uses of a refrigerator, DC, FF and SBS Refrigerators, Ozone Layer , Refrigerants, Gases used in Refrigerator , their chemical composition, CFC and Non CFC Gases, How a refrigerator works 	Different types of Refrigerator Multi-meter Pressure Gauge Electrical Drill Clamp Meter Tube Cutter Tube Bender Vacuum Pump Weighing Scale Gas Cylinder Temperature meter Spanner Screw Driver set
5	Attend to service complaints – AC Theory Duration (hh:mm) 06:00 Practical Duration (hh:mm) 14:00 Corresponding NOS Code ELE/N3117	<ul style="list-style-type: none"> AC, Types, Refrigeration cycle for AC, Refrigerants, Lubrication , Oils , storage cylinder colour codes , Environment safety , Thermal Properties of Gases, Boyle’s and Charles’ Laws, Concept of Ton of Refrigeration, Capacity , Compressor-Rotary , reciprocating , how they work , Why they fail, Precautions, Condensers , evaporators, Blowers , Driers , Filters , Relays ,Electro mechanical parts , Refrigerants, BTU, EER, Star Rating ,BEE Rating, E waste , parts of WAC and SAC 	Different type of Air conditioner Multi-meter Pressure Gauge Electrical Drill Clamp Meter Tube Cutter Tube Bender Vacuum Pump Weighing Scale Gas Cylinder Temperature meter Spanner Screw Driver set
6	Use of Tools Theory Duration (hh:mm) 06:00 Practical Duration (hh:mm) 14:00 Corresponding NOS Code ELE/N3112 , ELE/N3113 , ELE/N3114	<ul style="list-style-type: none"> Tools and equipment and handtools , use , care , safety, symbols Use of Multimeter, Megger, Clamp Meter, Tools required, Checking of voltages and Current, Wiring Diagram, Vaccum Pump , Gauge , Digital Weighing Balance , checking of individual parts Installation of SAC, Comfort zone for human , Flaring and Swaging , Brazing, Flux , Heat Load, Installation of IDU and ODU, Fixing of wall mount plate, 	Multi-meter Pressure Gauge Electrical Drill Clamp Meter Tube Cutter Tube Bender Vacuum Pump Weighing Scale Gas Cylinder Temperature meter Spanner Screw Driver set

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> Choice of pipes' material, Height of ODU, Site for ODU, U-Trap, Faults and Rectification, Gases used in AC, their chemical composition, Leak Test, Flushing, Uses of Nitrogen, Brazing, Types of flames, Material of Brazing Rod, Reasons for choice of this material, quality standards to be followed 	
7	<p>Install newly purchased Refrigerator , WM and AC</p> <p>Theory Duration (hh:mm) 08:00</p> <p>Practical Duration (hh:mm) 14:00</p> <p>Corresponding NOS Code ELE/N3112 , ELE/N3113 , ELE/N3114</p>	<ul style="list-style-type: none"> Installation of WM, Ref, SAC and WAC, Structural Requirements , Selection of Place, Electricity 	<p>Different type of Air conditioner</p> <p>Different types of Refrigerator</p> <p>Different types of Washing machine</p>
8	<p>Do's and Do Not's</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 14:00</p> <p>Corresponding NOS Code ELE/N3101</p>	<ul style="list-style-type: none"> Common mistakes by technicians Faults and Fault Finding Techniques- WM , Ref, Split and Window AC Faults WM- Dead, No wash, No spin, Vibrations, PCB Faults Ref-Dead, No cooling, Less Cooling, No ice formation, Vibration sound AC-Dead, Stand by, No Cooling, Less Cooling, Extra Sound when on , choking , moisture , low refrigerant , gas leak 	<p>Videos, PPT's, Laptop, Projector, Projector Screen, White Board, Marker, Duster, Internet</p>
9	<p>Interact with colleagues</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 14:00</p>	<ul style="list-style-type: none"> Manners and Etiquettes, Behavior on phone, Dressing Sense, Personal Hygiene, Presentation Skills, People Skills, Handling difficult people and situations, Avoiding gaudy wear, Method of speaking, Language and Tone, Maintaining distance while speaking, Body Language 	N/A

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Corresponding NOS Code ELE/N9901		
	Total Duration Theory Duration 60.00 Practical Duration 162.00	Unique Equipment Required: Different type of Air conditioner Different types of Refrigerator Different types of Washing machine Multi-meter Pressure Gauge Electrical Drill Clamp Meter Tube Cutter Tube Bender Vacuum Pump Weighing Scale Gas Cylinder Temperature meter Spanner Screw Driver set	

Grand Total Course Duration: 222 Hours 00 Minutes

(This syllabus/ curriculum has been approved by ELECTRONIC SECTOR SKILL COUNCIL OF INDIA)

Trainer Prerequisites for Job role: Field Engineer RACW mapped to Qualification Pack: “ELE/Q3105”

Sr. No.	Area	Details
1	Job Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ELE/Q3105 Version 1.0”.
2	Personal Attributes	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for Earn and keep oneself updated with the latest in the mentioned field quality and for developing others; well-organised and focused, eager to learn.
3	Minimum Educational Qualifications	12 th Standard Pass with 2 Years Industry Experience.
4a	Domain Certification	Certified for Job Role: “Field Engineer RACW” mapped to QP: “ELE/Q3105 version 1.0 ”. Minimum accepted score 70 %
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/Q1402”. Minimum accepted score =70%
5	Experience	2 Years hard-core experience to Repair Mobile Phone in any Service Centre

Annexure: Assessment Criteria

Assessment Criteria for Field Engineer – RACW	
Job Role	Field Engineer RACW
Qualification Pack :	ELE/Q3105 Version 1.0
Sector Skill Council : Electronics Sector Skill of India	Electronics Sector Skill of India

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5	To pass the Qualification Pack , every trainee should score a minimum of 70% in every NOS
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Sr. No.	NOS No.	NOS Name	Total Marks	Marks Allocation: Skills	Marks Allocation: Knowledge	Marks Allocation: Behavior
1	ELE/N3101 Version 1.0	Engage with customer for service	100	60	40	
2	ELE/N3112 Version 1.0	Install newly purchased refrigerator	100	60	40	
3	ELE/N3113 Version 1.0	Attend to service complaints - refrigerator	100	60	40	
4	ELE/N3114 Version 1.0	Install newly purchased air conditioner	100	60	40	
5	ELE/N3115 Version 1.0	Attend to service complaints – Air conditioner	100	60	40	
6	ELE/N3116 Version 1.0	Install newly purchased washing machine	100	60	40	
7	ELE/N3117 Version 1.0	Attend to service complaints – washing machine	100	60	40	
8	ELE/N9901 Version 1.0	Interact with colleagues	100	60	40	
	Total:		800	480	320	
	Percentage Weightage:			60%	40%	
	Minimum Pass% to qualify:			70%	70%	



Electronics Sector Skill Council of India

422, Okhla Industrial Estate, Phase-III, New Delhi-110020