



COMPETENCY BASED CURRICULUM
DOMESTIC WIRING
BQF CERTIFICATE-II

**Department of Workforce Planning and Skills
Development**
Ministry of Education and Skills Development



Course Curriculum

Domestic Wiring BQF Certificate-II

Technical Trainers Training and Resource Center
Department of Workforce Planning and Skills Development
Ministry of Education and Skills Development
Thimphu

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FOREWORD

Bhutan has seen a gradual increase in the requirement of skilled workers in recent years due to growth of industries. However, supply of skilled workforce that are responsive to the needs of the industry has not been able to keep in pace with the industry demand. Since the skilled workers are crucial ingredient for socio-economic development of the country, it is important to have adequate number of trained and certified workers. With growing industries, the “Domestic Wiring Technician” are not only the most significant occupation but also have high demand in the labour market. In an effort to meet the skilled human resources requirement in the area of power sector, it is imperative to deliver training based on Competency Based Training system in Food Processing to ensure quality and adequate number of work force in this sector.

To this end, the Department of Workforce Planning and Skills Development (DWPSD) is pleased to present the Competency Based Curriculum for Domestic Wiring Technician BQF Certificate-II course developed based on national competency standard. Since it is an outcome of a more participatory process of curriculum development, it is expected to provide training delivery with reformed approaches having its content being directly related to labour market needs, focusing on imparting of skills and assessment based on industry work standards. We believe that the Competency Based Curriculum will help in bridging the skill gap between industry’s needs and training institutes thereby enhance the employability of the technical graduates.

The Department acknowledges the valuable contributions made by institutes, officials, and experts from relevant industries who were involved in the design and development of this curriculum. As it is a dynamic document which may require revision based on the needs of the changing labour market, the Department look forward to receiving valuable feedbacks from the institutes and the industries to further improve and refine the curriculum

The Department hope that this document will help advance Competency Based Learning in most of the TVET Institutions.



(Sangay Dorji)

Offtg. Director

Department of Workforce Planning and Skills Development

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Experts involved in the Revision of Domestic Wiring Technician BQF Certificate-II curriculum:

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Competency Profile
Trade: Domestic Wiring BQF Certificate-II
Occupation: Domestic Wiring Technician

Competency Area	Sub- Competency Area	Competencies/Tasks			
A: Apply fundamentals of electricity	A1 Apply basic electrical theory	A1.01 Test conductor and insulator	A1.02 Perform instrument reading	A1.03 Measure resistance	A1.04 Measure voltage
		A1.05 Measure current	A1.06 Measure power	A1.07 Measure frequency	A1.08 Measure energy
	A2 Verify DC circuits	A2.01 Verify Ohm's Law	A2.02 Verify characteristics of series circuit	A2.03 Verify the characteristic of parallel circuits	A2.04 Verify the characteristics of series-parallel combined circuit
		A2.05 Verify Kirchhoff's current Law	A2.06 Verify Kirchhoff's voltage Law		
	A3 Verify AC circuits	A3.01 Verify the characteristics of A.C and D.C	A3.02 Check phase sequence of 3 ϕ supply	A3.03 Verify the characteristic of balanced and unbalanced load in star connection	A3.04 Verify the characteristics of balance delta load connection
	A4	A4.01 Test inductor	A4.02 Test capacitor	A4.03 Test diode	A4.04 Test Zener diode

	Apply basic electronics theory	A4.05 Test transistor			
B: Carryout installation of panel board	B1: Install protective devices for single phase	B1.01 Install distribution board for 1 ϕ	B1.02 Install Miniature Circuit Breaker for 1 ϕ	B1.03 Install Residual Current Circuit Breaker for 1 ϕ	B1.04 Install Earth Leakage Circuit Breaker for 1 ϕ
		B1.05 Install change over switch for 1 ϕ			
	B2: Install protective devices for three phase	B2.01 Install bus bar	B2.02 Install distribution board for 3 ϕ	B2.03 Install Miniature Circuit Breaker for 3 ϕ	B2.04 Install Residual Current Circuit Breaker for 3 ϕ
		B2.05 Install Earth Leakage Circuit Breaker for 3 ϕ	B2.06 Install Molded Case Circuit Breaker	B2.07 Install change over switch for 3 ϕ	
	B3: Install earthing and lightning arrester	B3.01 Install plate earthing	B3.02 Install pipe earthing	B3.03 Install slab earthing	B3.04 Install chemical earthing
		B3.05 Install building LA			
C: Carryout domestic wiring	C1 Prepare wire joints	C1.01 Prepare rat tail joint	C1.02 Prepare T-Joint	C1.03 Prepare straight joint	C1.04 Prepare married joint
	C2 Perform lighting and power circuit wiring	C2.01 Perform PVC Casing Capping wiring for 2 lighting loads	C2.02 Perform PVC Conduit wiring for 2 lighting & 1 power loads	C2.03 Perform MS conduit wiring for 3 lighting and 1 power load	C2.04 Lay concealed conduit

		C2.05 Perform staircase wiring	C2.06 Perform hostel wiring	C2.07 Perform call bell wiring	C2.08 Perform go-down wiring
		C2.09 Perform corridor wiring			
	C3 Perform installation test	C3.01 Perform IR test	C3.02 Perform continuity test	C3.03 Perform polarity test	C3.04 Perform earth continuity test
		C3.05 Perform earth resistance test	C3.06 Perform earth resistivity test		
	C4 Troubleshoot electrical fittings	C4.01 Troubleshoot LED fault	C4.02 Troubleshoot ceiling fan and fitting	C4.03 Troubleshoot socket fault	
	C5 Estimate materials	C5.01 Estimate materials for PVC Casing capping wiring	C5.02 Estimate materials for conduit wiring	C5.03 Estimate materials for concealed wiring	
D: Carryout installation of security and communication system	D1 Install security system	D1.01 Prepare BNC connector	D1.02 Install analog CCTV	D1.03 Install digital CCTV	D1.04 Install burglar alarm system
		D1.05 Install hooter/siren	D1.06 Install fire alarm system		
	D2	D2.01 Prepare LAN cable	D2.02 Install I/O box	D2.03 Prepare Balun plug	D2.04 Connect RF connector

	Install communication system	D2.05 Install TV socket			
	D3 Test security and communication system wiring	D3.01 Test BNC connector	D3.02 Test modular jack	D3.03 Test LAN cable	D3.04 Test fire alarm system
		D3.05 Test burglar alarm system	D3.06 Test analog CCTV system	D3.07 Test digital CCTV system	
	D4 Set up Audio Visual system	D4.01 Set up audio system	D4.02 Set up visual system	D4.03 Test performance of AV system	

COURSE INFORMATION

COURSE TITLE	Domestic Wiring
LEVEL	BQF Certificate (NC) Level 2
COURSE OBJECTIVE	Upon completion of this training program, the trainees will be able to: • Apply Fundamentals of electricity • Carry out installation of panel board • Carry out domestic wiring • Carry out installation of security and communication system
COURSE DESCRIPTION	This curriculum is designed to provide knowledge, skills and attitude to trainees to be competent domestic wiring technician in accordance with industry standards Upon completion of the course, graduates will be able to carry out installation of panel board, domestic wiring and security & communication system. In addition, this course will also prepare the graduates to comply with regulatory and organizational requirements for practicing Occupational Health and Safety procedures. This course also includes the soft skills components such as basic computer application, entrepreneurship, numeracy, communication and value education to supplement core competencies and enhance practical skills.
TOTAL DURATION	1359 Hours
TRAINER AND TRAINEE RATIO	1:12 (Practical) 1:20 (Theory)
ENTRY REQUIREMENT	• Completed class X
TVET TRAINER REQUIREMENTS	• Must have a minimum qualification of diploma in relevant field with three years of working experience; • Must have undergone Training of Trainers-Technical Instruction and Pedagogy; • Must have at least 5 years job/industry experience in relevant field if institute hire instructors or guest lecturer from industry.

COURSE OUTLINE

Sl. No	Subject /Module	Duration (Hours)	Content Competencies (Mapped)
1.	Core modules	421	CC
2.	OJT	408 (3 Months)	CC
3.	Applied Dzongkha	42	SS
4.	ICT	68	SS
5.	Applied Mathematics	60	SS
6.	Technical English	82	SS
7.	Entrepreneurship	70	SS
8.	Occupational Health and Safety (OHS)	34	ES
9.	Sustainable Consumption and Production (SCP)	36	ES
10.	Professional Ethics	68	PD
11.	Assessment	70	
	Total Course Duration	1359	

Note: (*) This curriculum contains core modules which cover main competencies of Domestic Wiring BQF Certificate-II and OJT component. There are separate curricula for subjects/modules for delivery of soft skills, professional development & values and environmental concern & safety. In order to achieve the qualification of Domestic Wiring BQF Certificate-II, the subjects and modules listed must be accomplished as per the credit hours provided.

Content Competencies:

CC-Core Competencies

SS-Soft Skills

PD-Professional Development and Values

ES-Environmental concern and Safety

COURSE STRUCTURE FOR CORE COMPETENCIES

Training Modality	Module Title	Learning outcomes	Nominal Duration (Hour)
1. Institute Training	A. Applying fundamentals of electricity	A1. Apply basic electrical theory A2. Verify DC circuits A3. Verify AC circuits A4. Apply basic electronic theory	100
	B. Carrying out installation of panel board	B1. Install protective device for single phase B2. Install protective device for three phases B3. Install earthing and lightning arrestor	81.5
	C. Carrying out domestic wiring	C1. Perform wire joints C2. Perform lightning and power circuit wiring C3. Perform installation test C4. Troubleshoot electrical fittings C5. Estimate materials	150
	D. Carrying out installation of security and communication system	D1. Install security system D2. Install communication system D3. Test security and communication system wiring D4. Perform wiring of audio and visual	89.5
2. On the Job Training	B. Carrying out installation of panel board	B1. Install protective device for single phase B2. Install protective device for three phases B3. Install earthing and lightning arrestor	408 Hrs./3 months
	C. Carrying out domestic wiring	C1. Perform wire joints C2. Perform lightning and power circuit wiring C3. Perform installation test C4. Troubleshoot electrical fittings C5. Estimate materials	
	D. Carrying out installation of security and communication system	D1. Install security system D2. Install communication system D3. Test security and communication system wiring D4. Perform wiring of audio and visual	
Total CC Duration:			829

ASSESSMENT AND CERTIFICATION SYSTEM

ASSESSMENT

Formative assessment for every module and learning outcome will be conducted through assignments, project works, continuous assessment, demonstration of practical skills/observations, oral questioning and written test.

Summative assessment after completion of each national certificate level will be conducted by TVET Quality Council, Bhutan Qualifications and professional certification authority, MoESD as per the National Competency Standards and Guidelines for National Assessment and Certification System, provided the course is accredited with TVET Quality Council, Bhutan Qualifications and professional certification authority, MoESD .

CERTIFICATION

On successful completion of every module, the institute will award a certificate of achievement to the trainees. The TVET Quality Council, Bhutan Qualifications and professional certification authority, MoESD will award a National Certificate to the trainees upon the successful completion of NC level assessment.

COURSE DELIVERY

1. Modular
2. Demonstration
3. Lecture
4. Industrial training/attachment
5. Project work
6. Problem-based learning
7. Project-based learning

RESOURCES

Materials

Wire, metal, plastic, rubber, wood, connectors, coil/inductor, permanent magnet loads, insulation tape, resistor, colour coding chart, bread board, connecting probes, capacitor, bulb holder, bulb, PVC insulated copper wire, diode, Zener diode, transistor, jumper wires, soldering lead, crocodile clips, LED, LED fittings, indicator lamp, fuse, wire sleeve, ceiling fan components, panel mounting stand, marker pen, DC indicator lamp, connecting wires, screws, dowels, lugs, PVC conduit, saddles, BNC connector, cable tag, I/O box, drill bits, coaxial cable, match box, fuel, LAN cable, RJ45 connector, patch cord, cable modular jack, marking cloth insulation tape, Hacksaw blade, pencil/ chalk, casing capping & fittings, MCBs, RCCB, batten holders, modular boxes, switches, concealed conduit and fittings, DB, machine screw, energy meter, casing capping nail, MS conduit & fittings, power socket, fish wire, call bell, binding wire, funnel, wire mesh, nut and bolt, salt, charcoal, sand, cement bricks/stone, pipe electrode, GI pipe, hacksaw blade, building LA and accessories, G.I/ copper strip, test lamp, fluorescent lamp fittings, HID lamp ceiling fan, graph paper, paper, drawing, calculator, pencil, eraser, igniter, ballast, drawing, BSR, LMC, tube light fittings, speaker cable, speak-on cable, HDMI cable, pointer, TV remote and projector screen

Tools

Pliers, neon tester, voltage detector, wire stripper, soldering iron, crimping tools, coaxial cable stripper, mallet, spirit level, plumb bob, file, chisels, reamer, Spade, pick axe, shovels, crow bar, poker, hacksaw frame, hammer, calculator, measuring tape, screw driver set, file set, electrician knife, neon tester, spanner set and wrench

Instrument

Multi-meter, voltmeter/potentiometer, frequency meter, energy meter, ohm meter, ammeter, wattmeter, LCR meter, phase sequence meter, clamp-on meter, inclinometer, magnetic compass, hydrometer, LAN cable tester and Insulation Resistance tester

Equipment

AC/DC variable power source, CRO, function generator, 3-phase AC source, trainer kit, centre tap transformer, drilling machine, changeover switch, portable hand blower, television/display, digital video recorder, DC power supply unit, camera, UPS, siren, hooter, burglar alarm, control unit, fire alarm, sensors, detectors, ladder, POE switch, NVR, DVR, hard disk, bench vice, soldering iron, IR tester, earth resistance tester, ladder, drawing board, wiring board, cordless power tool, Computer, Handheld Microphone, charger, XLR cables, Mixing console, Cross over, Mixer, Amplifier, Quarter inch Jack, Low frequency speakers (Sub-woofer), cordless power tools, High frequency speakers, outboard rack, Microphone stands, projector with mounting accessories and TV/monitor with mounting accessories

PPE

Safety gloves, safety boots, safety helmet, safety goggles, safety harness, mouth mask and reflective vest

Learning Materials

- Competency Based Learning Materials (CBLM)
- Reference books
- Hand-outs
- Audio visuals

Infrastructure and training facilities

- **Theory classroom size:** Minimum of 1.5 square meter per trainee.
- **Practical classroom size:** Minimum of 3 square meter per trainee. Other variables must be considered depending upon type of skill being taught and the number of trainees participating at one time.

MODULE INFORMATION:
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MODULE 1
ON
APPLYING FUNDAMENTALS OF ELECTRICITY

MODULE INFORMATION

Occupation	Domestic Wiring Technician
Competency Area	Apply basic fundamentals of electricity
Module Title	Applying basic fundamentals of electricity
Module Code	7411-L2-M1
Module Description	This module is structured to provide learners with the knowledge, skills and right attitude required to apply basic electrical & electronic theory and electronic theory, verify DC circuits and verify AC circuits
Nominal Duration	100 Hours
Certificate Level	BQF Certificate Level 2
Pre-requisite	Completed class X
Learning Outcome	1.Apply basic electrical theory 2.Verify DC circuit 3.Verify AC circuit 4.Apply basic electronic theory

DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Applying basic fundamentals of electricity		
Module Code	7411- L2-M1		
Learning Outcome 1	Apply basic electrical theory		
Duration	Theory: 10 hours	Practical:21 hours	Total: 31 hours
Assessment Criteria	- Conductor and insulator are tested as per the standard procedures - The instrument reading is performed as per the standard procedures - Resistance is measured as per standard procedures - Voltage is measured as per the standard procedures - Current is measured as per the standard procedures - Power is measured as per the standard procedures - Frequency is measured as per the standard procedures - Energy is measured as per the standard procedure		
Content	A1.00 Introductory knowledge - Introduction to electricity - Generation of electricity - Source of electricity - Trends and scope of Domestic Wiring Technician A1.01 Testing conductor and insulator Knowledge - Types of conductors, insulator and semiconductor - Properties of conductor, insulator and semiconductor Skills - Using multimeter - Using IR tester - Analytical skills Attitude, safety and environmental concern - Having work ethics and integrity - Ensuring efficient in using resources - Proper handling of tools, materials and equipment - Ensuring to follow OHS rules and regulation - Ensuring appropriate use of PPE - Ensuring proper disposal of waste A1.02 Performing instrument reading Knowledge - Definition of instruments - Types of scale - Types of electrical measuring instrument - Signs & symbols of electrical measuring instrument - Working principle of instrument - Function of instruments - Types of instrument error Skills - Instrument reading skills - Analytical skills - Numeracy skills		

	<i>Attitude, safety and environmental concern</i> • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to follow OHS rules and regulation A1.03 Measuring resistance <i>Knowledge</i> • Definition of resistance, resistor and resistivity • Unit and symbol of resistance • Factors affecting resistance • Types of resistor • Application of resistors • Selection of meter range • Colour coding of resistor <i>Skills</i> • Using multimeter • Using ohm meter • Analytical skills • Numeracy skills <i>Attitude, safety and environmental concern</i> • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to follow OHS rules and regulation A1.04 Measuring voltage <i>Knowledge</i> • Definition of voltage • AC and DC source • Unit and symbol of voltage • Selection of voltmeter range • Types of voltmeter <i>Skills</i> • Interpreting circuit diagrams • Using voltmeter • Using multimeter • Analytical skills • Numeracy skills <i>Attitude, safety and environmental concern</i> • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to follow OHS rules and regulation
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	A1.05 Measuring current Knowledge • Definition of current • Unit and symbols of current • Types of current • Effects of electric current • Selection of ammeter range • Types of ammeter Skills • Using ammeter • Using clamp-on meter • Using multimeter • Interpreting circuit diagrams • Analytical skills Numeracy skills Attitude, safety and environmental concern • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to follow OHS rules and regulation A1.06 Measuring power Knowledge • Definition of power • Unit and symbol of power • Relation between current, voltage and power • Types of power • Power triangle • Power factor • Selection of wattmeter range Skills • Interpreting circuit diagrams • Using wattmeter • Using multimeter • Analytical skills • Numeracy skills Numeracy skills Attitude, safety and environmental concern • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to follow OHS rules and regulation A1.07 Measuring frequency Knowledge • Definition of frequency • Unit and symbol of frequency
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	• Relation between time and frequency Skills • Using frequency meter • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to follow OHS rules and regulation A1.08 Measuring energy Knowledge • Definition of electric energy • Unit of electric energy • Calculation of energy consumed • Electricity tariff • Types of electrical load Skills • Using energy meter • Interpreting circuit diagram • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to follow OHS rules and regulation
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Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Wire, metal, plastic, rubber, wood, connectors, insulation tape, and resistor Tools • Pliers, screwdriver, voltage detector, neon tester and wire stripper Instrument • Multimeter, Voltmeter/potentiometer, Frequency meter, Energy meter, Ohm meter, ammeter, IR tester, clamp-on meter and wattmeter Equipment • AC/DC source or power supply unit PPE • Working dress and safety boot
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning

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Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work
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DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Applying basic fundamentals of electricity		
Module Code	7411- L2-M1		
Learning Outcome 2	Verify DC circuits		
Duration	Theory:12 hours	Practical: 24 hours	Total: 36 hours
Assessment Criteria	• Ohms law is verified as per the job requirement following standard procedure • Characteristics of series circuit is verified as per the job requirement following standard procedure • Characteristics of parallel circuit is verified as per the job requirement following standard procedure • Characteristics of series parallel combined circuit is verified as per the job requirement following standard procedure • Kirchoff's current law is verified as per the job requirement following standard procedure • Kirchoff's voltage law is verified as per the job requirement following standard procedure		
Content	A2.01 Verifying Ohm's law Knowledge • Ohm's Law • Application of Ohm's Law • Limitations of Ohm's Law Skills • Interpreting circuit diagrams • Using multimeter • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Proper handling and storage of instruments • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over heating of resistor A2.02 Verifying characteristics of series circuit Knowledge • Characteristics of series circuit • Advantages and disadvantages of series circuit • Applications of series circuit Skills • Interpreting circuit diagrams • Using multimeter • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having integrity and work ethics		

	• Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over heating of resistor A2.03 Verifying characteristics of parallel circuit Knowledge • Characteristics of parallel circuit • Advantages and disadvantages of parallel circuit • Applications of parallel circuit Skills • Interpreting circuit diagrams • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over heating of resistor A2.04 Verifying characteristics of series-parallel combined circuit Knowledge • Advantages and disadvantages of series-parallel combined circuit • Applications of series-parallel combined circuit • Comparison of series and parallel circuit Skills • Using multimeter • Interpreting circuit diagram • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over heating of resistor A2.05 Verifying Kirchhoff's current law Knowledge • Kirchhoff's current law • Sign convention of Kirchhoff's current law • Limitations of Kirchhoff's current law • Application of Kirchhoff's current law
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	<i>Skills</i> • Interpreting circuit diagrams • Using multimeter • Analytical skills • Numeracy skills <i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over heating of resistor A2.06 Verifying Kirchhoff's voltage law <i>Knowledge</i> • Kirchhoff's voltage law • Sign convention of Kirchhoff's voltage law • Limitations of Kirchhoff's voltage law • Application of Kirchhoff's voltage law <i>Skills</i> • Interpreting circuit diagrams • Using multimeter • Analytical skills • Numeracy skills <i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over heating of resistor
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Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Pen & paper, resistor, jumper wires and bread board Tools • Socket set, pipe wrench set, stainless steel containers, crate, knife, jug, bucket, screw driver set, peeler, knife, cutting board, bucket, strainer or cheese clothes, spatula, ladle, container, jug, funnel, refractometer, hydrometer, vessels, penetrometer, strainer, siphoning tube, PH meter, food grade barrel, microbial growth checking tools, chemical analysis tools, salinometer and digital weighing machine Tools • Pliers, screwdriver, neon tester, voltage detector and wire stripper Instruments • Multimeter, voltmeter, ammeter and ohm meter Equipment • DC Power source PPE • Working dress and safety boot
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity

DOMESTIC WIRING BQF CERTIFICATE-II

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Applying basic fundamentals of electricity		
Module Code	7411- L2-M1		
Learning Outcome 3	Verify AC circuits		
Duration	Theory:5 hours	Practical:13 hours	Total: 18 hours
Assessment Criteria	• Characteristics of AC and DC is verified as per the standard procedures • Phase sequence of 3-phase supply is checked as per the standard procedures • Characteristics of balanced and unbalanced loads in star connection are verified as per the standard procedures • Characteristic of balanced delta load is verified as per the standard procedures		
Content	A3.01 Verifying characteristics of AC and DC Knowledge • Types of source • Characteristics of AC & DC • Advantage of AC over DC • Advantage of DC over AC • Applications of Cathode Ray Oscilloscope (CRO) Skills • Operating CRO • Operating function generator • Using multimeter • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Proper handling of equipment • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper handling of CRO and function generator • Ensuring not to inject test voltage beyond rated value A3.02 Checking phase sequence of 3 phase supply Knowledge • Differences between single and poly phase • Advantages of poly-phase over single phase • Types of poly-phase circuit • Purpose of checking phase sequence Skills • Using phase sequence meter • Observation skills • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE		

	• Ensuring proper disposal of waste A3.03 Verifying characteristics of balanced and unbalanced load in star connection Knowledge • Purpose of interconnection of three phases • Differences between star and delta connection • Characteristics of balanced star load • Characteristics of unbalanced star load in 3-wire & 4-wire supply system Skills • Using multimeter • Using clamp-on meter • Observation skills • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over voltage and under voltage A3.04 Verifying characteristics of balanced delta load connection Knowledge • Advantages and disadvantages of delta connection • Characteristics of balanced delta load • Applications of delta connection Skills • Using multimeter • Interpreting circuit diagram • Using clamp-on meter • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid overvoltage and under voltage
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Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop M Materials • Connecting probes, wire, bulb holder, bulb and insulation tape Tools • Pliers, screwdriver, neon tester, voltage detector and wire stripper Instrument • Multimeter, wattmeter, phase sequence meter, ammeter, voltmeter and clamp-on meter Equipment • CRO, function generator, 3-phase AC source and variable load bank PPE • Working dress and safety boot
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Applying basic fundamentals of electricity		
Module Code	7411- L2-M1		
Learning Outcome 4	Apply basic electronic theory		
Duration	Theory:5 hours	Practical:10 hours	Total: 15 hours
Assessment Criteria	- Inductor is tested as per the standard procedures - Capacitor is tested as per the standard procedures - Diode is tested as per the standard procedures - Zener diode is tested as per the standard procedures - Transistor is tested as per the standard procedures		
Content	AA4.01 Testing inductor Knowledge - Definition of inductor - Symbol of inductor - Characteristics of inductor - Types of inductor - Application of inductor - Importance of testing inductor Skills - Using LCR meter - Analytical skills - Numeracy skills Attitude, safety and environmental concern - Having integrity and work ethics - Being efficient in using resources - Proper handling of equipment - Ensuring to follow OHS rules and regulations - Ensuring appropriate use of PPE A4.02 Testing capacitor Knowledge - Definition of capacitor - Symbol of capacitor - Characteristics of capacitor - Types of capacitor - Application of capacitor - Importance of testing capacitor Skills - Using LCR meter - Analytical skills - Numeracy skills Attitude, safety and environmental concern - Having integrity and work ethics - Being efficient in using resources - Ensuring to follow OHS rules and regulations - Ensuring appropriate use of PPE - Ensuring proper disposal of waste		

	A4.03 Testing diode Knowledge • Definition of diode • Symbol of diode • V-I Characteristics of diode • Types of diode • Application of diode • Importance of testing diode Skills • Using multimeter • Observation skills • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over voltage and under voltage A4.04 Testing Zener diode Knowledge • Definition of Zener diode • Symbol of Zener diode • V-I characteristics of Zener diode • Application of Zener diode Skills • Using multimeter • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid overvoltage and under voltage A4.05 Testing transistor Knowledge • Definition of transistor • Symbol of transistors • Transistor biasing • Types of transistor • V-I characteristics of transistor • Application of transistor
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	Skills • Using multimeter • Analytical skills • Numeracy skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid overvoltage and under voltage
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop M Materials • Inductor, capacitor, diode, Zener diode, transistor, jumper wire and bread board Instrument • Multimeter and LCR meter Equipment • 3-phase AC source and variable load bank PPE • Working dress and safety boot
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity

DOMESTIC WIRING BQF CERTIFICATE-II

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

MODULE 2
ON
CARRYING OUT INSTALLATION OF PANEL BOARD

MODULE INFORMATION

Occupation	Domestic Wiring Technician
Competency Area	Carry out installation of panel board
Module Title	Carrying out installation of panel board
Module Code	7411- L2-M2
Module Description	This module is structured to provide learners with the knowledge, skills and right attitude required to install protective device for single & three phase, lighting arrestors and earthing
Nominal Duration	81.5 Hours
Certificate Level	BQF Certificate Level 2
Pre-requisite	Must complete module 7411-L2-M1
Learning Outcome	1.Install protective devices for single phase 2.Install protective devices for three phases 3.Install earthing and lighting arrestor

DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Carrying out installation of panel board		
Module Code	7411- L2-M2		
Learning Outcome 1	Install protective devices for single phase		
Duration	Theory: 5 hours	Practical:7.5 hours	Total: 12.5 hours
Assessment Criteria	- Single Phase Distribution Board is installed as per the standard procedures - Miniature Circuit Breaker (MCB) are installed as per the standard practices - The installation of Residual Current Circuit Breaker for 1 Φ is carried out as per standard procedures - ELCB is installed as per the following standard procedures - Changeover switch is installed as per the standard procedures		
Content	B1.01 Installing distribution board for single phase Knowledge - Types of Distribution Board - Components of Distribution Board - Function of Distribution Board - Connection for SPN DB Skills - Using drill machine - Using spirit level - Observation skills Attitude, safety and environmental concern - Having integrity and work ethics - Proper handling and storage of tools and materials - Being efficient in using resources - Ensuring to follow OHS rules and regulation - Ensuring correct use of PPE - Ensuring proper disposal of waste B1.02 Installing miniature circuit breaker for single phase Knowledge - Definition of MCB - Types of MCB - Application of MCB - Selection of MCB - Working principles of MCB Skills - Using neon tester - Observation skills - Analytical skills Attitude, safety and environmental concern - Being efficient in using resources - Having integrity and work ethics - Proper handling and storage of tools - Ensuring to follow OHS rules and regulation - Ensuring correct use of PPE - Ensuring proper disposal of waste		

	B1.03 Installing Residual Current Circuit Breaker (RCCB) for single phase Knowledge • Definition of RCCB • Classification of RCCB • Working principle of RCCB • Construction of RCCB and their functions • Selection of RCCB • Application of RCCB Skills • Using neon tester • Observation skills • Analytical skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulation • Ensuring correct use of PPE • Ensuring proper disposal of waste B1.04 Installing Earth Leakage Circuit Breaker (ELCB) for single phase Knowledge • Definition of ELCB • Working principles of ELCB • Function of ELCB • Importance of setting tripping current Skills • Using neon tester • Observation skills • Analytical skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools and materials • Ensuring to follow OHS rules and regulation • Ensuring appropriate use of PPE • Ensuring proper disposal of waste B1.05 Installing change over switch for single phase Knowledge • Definition of changeover switch • Types and application of change over switch • Current rating of changeover switch Skills • Using drilling machine • Using multimeter • Observation skills
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	<i>Attitude, safety and environmental concern</i> • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools and materials • Ensuring to follow OHS rules and regulation • Ensuring appropriate use of PPE • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Wires, sleeves, MCB, ELCB, RCCB, distribution board, insulation tape, thimble/lugs, cables, wooden screws, anchor bolts, screws and dowels (PVC, Wood) Tools • Pliers, screwdriver set, hammer, combination pliers, electrician knife, crimping tool, spirit level, measuring tape and wire stripper Instrument • Multimeter Equipment • Drilling Machine and changeover switch PPE • Working dress, safety gloves, safety boots, safety helmet, safety goggles, safety harness, mouth mask and reflective vest
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity

DOMESTIC WIRING BQF CERTIFICATE-II

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Carrying out installation of panel board		
Module Code	7411- L2-M2		
Learning Outcome 2	Install protective devices for three phase		
Duration	Theory:4.5 hours	Practical:10.5 hours	Total: 15 hours
Assessment Criteria	• Bus bar is installed as per the standard procedures • Three Phase Distribution Board is installed as per the standard procedures • Miniature Circuit Breaker (MCB) for 3Ø are installed as per the standard practices • ELCB is installed as per the following standard procedures • Residual Current Circuit Breaker for 3 Φ is installed as per standard procedures • Moulded case circuit breaker is installed as per the standard practices • Changeover switch is installed as per the standard procedures		
Content	B2.01 Installing bus bar Knowledge • Definition of bus bar • Selection of bus bar Skills • Using drill machine • Using spirit level • Analytical skills • Observation skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulation • Ensuring correct use of PPE • Ensuring proper disposal of waste B2.02 Installing distribution board for three phase Knowledge • Types of Distribution Board Skills • Using drill machine • Using spirit level • Analytical skills • Observation skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste		

	B2.03 Installing miniature circuit breaker for three phase Knowledge • Application of 3Ø MCB • Selection of 3Ø MCB • Working principles of 3Ø MCB • Connection of 3Ø MCB • Colour coding for the connection of 3Ø MCB Skills • Using multimeter • Using neon tester • Analytical skills • Observation skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulation • Ensuring correct use of PPE • Ensuring proper disposal of waste B2.04 Installing Residual Current Circuit Breaker (RCCB) for three phase Knowledge • Ratings of RCCB for 3Φ • Advantages and limitations of RCCB Skills • Using multimeter • Using neon tester • Communication skills • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Proper handling and storage of tools • Being efficient in using resources • Ensuring to follow OHS rules and regulation • Ensuring correct use of PPE • Ensuring proper disposal of waste B2.05 Installing Earth Leakage Circuit Breaker (ELCB) for three phase Knowledge • Importance of setting tripping current • Selection of ELCB Skills • Using neon tester • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Proper handling and storage of tools
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	• Being efficient in using resources • Ensuring to follow OHS rules and regulation • Ensuring appropriate use of PPE • Ensuring proper disposal of waste B2.06 Installing Moldded Case Circuit Breaker (MCCB) <i>Knowledge</i> • Definition of MCCB • Purpose of MCCB • Selection of MCCB <i>Skills</i> • Using drill machine • Using spirit level • Analytical skills • Observation skills <i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Proper handling and storage of tools • Being efficient in using resources • Ensuring to follow OHS rules and regulation • Ensuring appropriate use of PPE • Ensuring proper disposal of waste B2.07 Installing change over switch for three phase <i>Knowledge</i> • Current rating of changeover switch <i>Skills</i> • Using multimeter • Using drilling machine • Communication skills <i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Proper handling and storage of tools • Being efficient in using resources • Ensuring to follow OHS rules and regulation • Ensuring appropriate use of PPE • Ensuring proper disposal of waste
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Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Screws, MCB, MCCB, RCCB, ELCB, distribution board, bus bar, nail, dowels (PVC, wood), wires, insulation tape, thimble/lugs, cables, cable glands, nuts & bolts, sleeves and anchor bolts Tools • Pliers, screwdriver set, electrician knife, crimping tool, spirit level, measuring tape, wire stripper, hammer, adjustable wrench, ring type spanner set, neon tester and open-ended spanner set Instrument • Multimeter Equipment • Energy meter, ladder, drilling machine and changeover switch PPE • Working dress, safety gloves, safety boots, safety helmet, safety goggles, safety harness, mouth mask and reflective vest
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning

DOMESTIC WIRING BQF CERTIFICATE-II

Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work
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DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Carrying out installation of panel board		
Module Code	7411- L2-M2		
Learning Outcome 3	Install earthing and lighting arrestors		
Duration	Theory:6 hours	Practical:48 hours	Total: 54 hours
Assessment Criteria	• Plate earthing is installed as per the standard procedures • Pipe earthing is installed as per the standard procedures • Slab earthing is installed as per the standard procedures • Chemical earthing is installed as per the standard procedures • Building lighting arrestor is installed as per the standard procedures		
Content	B3.01 Installing plate earthing Knowledge • Introduction to earthing • Types of earthing • Factors affecting soil resistivity • Purpose of watering arrangement • Artificial treatment of soil • Earth continuity conductor • Size of earth lead • Purpose of charcoal and salt • Purpose of bonding earth electrode • Importance of neutral earthing system • Advantages of plate earthing • Application of plate earthing Skills • Interpreting drawing • Masonry skills • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Efficient use of materials • Ensuring to follow OHS rules and regulation • Ensuring appropriate use of PPE • Ensuring proper disposal of waste B3.02 Installing pipe earthing Knowledge • Advantages of pipe earthing • Application of pipe earthing Skills • Interpreting drawing • Masonry skills • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Efficient use of materials • Ensuring to follow OHS rules and regulation		

	• Ensuring appropriate use of PPE • Ensuring proper disposal of waste B3.03 Installing slab earthing Knowledge • Introduction to slab earthing • Application of slab earthing • Advantages of slab earthing Skills • Using welding machine • Using spanner • Observation skills • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Efficient use of materials • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste B3.04 Installing Chemical earthing Knowledge • Introduction to chemical earthing • Application of chemical earthing • Advantages of chemical earthing Skills • Using welding machine • Using spanner • Communication skills • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Efficient use of materials • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste B3.05 Installing building Lighting Arrestor (LA) Knowledge • Definition of LA • Function of LA • Types of building LA • Application of building LA Skills • Interpreting drawings • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics
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	• Efficient use of materials • Ensuring to follow OHS rules and regulation • Ensuring appropriate use of PPE • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Funnel, distribution board, wire mesh, nut & bolt, salt, charcoal, sand, cement, chemical earthing compound, bricks, electrode, GI Pipe, earthing slab, earthing rod, GI wire, hacksaw blade, building LA and accessories, GI strip, screws, insulator/HDPE pipe and dowel Tools • Spade, pick axe, shovels, screwdriver set, pliers, measuring tape, Crowbar, spanners, spirit level, hammer, poker, electrician knife and hacksaw frame Equipment • Ladder PPE • Working dress, Safety gloves, safety shoes, safety helmet, safety goggles, safety harness, mouth mask and reflective vest
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity

DOMESTIC WIRING BQF CERTIFICATE-II

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

MODULE 3
ON
CARRYING OUT DOMESTIC WIRING

MODULE INFORMATION

Occupation	Domestic Wiring Technician
Competency Area	Carry out domestic wiring
Module Title	Carrying out domestic wiring
Module Code	7411- L2-M3
Module Description	This module is structured to provide learners with the knowledge, skills and right attitude required to prepare wire joints, perform lighting and power circuit wiring, perform installation test, troubleshoot building wiring and estimate materials
Nominal Duration	150 Hours
Certificate Level	BQF Certificate Level 2
Pre-requisite	Completed module 7411-L2-M2
Learning Outcome	1.Prepare wire joints 2.Perform lighting and power circuit wiring 3.Perform installation test 4.Troubleshoot electrical fittings 5.Estimate materials

DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Carrying out domestic wiring		
Module Code	7411- L2-M3		
Learning Outcome 1	Prepare wire joints		
Duration	Theory: 2 hours	Practical:4 hours	Total: 6 hours
Assessment Criteria	• Rat tail joint is prepared as per the standard procedures • T-joint is prepared as per the standard procedures • Straight joint is prepared as per the standard procedures • Married joint is prepared as per the standard procedures		
Content	C1.01 Preparing rat tail joint Knowledge • Types of wires • Types of wire joints • Purpose of joints • Importance of proper insulation • Consequences of improper joints and insulation • Application of rat tail joint Skills • Using wire stripper • Using soldering iron • Using insulation sleeves Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C1.02 Preparing T-Joint Knowledge • Application of T joint Skills • Using wire stripper • Using soldering iron • Using insulation sleeves Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C1.03 Preparing straight joint Knowledge • Application of straight joint Skills • Using wire stripper • Using soldering iron		

	• Using insulation sleeves Attitude, safety and environmental concern • Being time conscious • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C1.04 Preparing married joint Knowledge • Application of married joint Skills • Using wire stripper • Using soldering iron • Using insulation sleeves Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Wires, Markin cloth, insulation sleeves, lugs (thimble), terminal cap, soldering lead & flux and insulation tape Tools • Combination plier, measuring tape, wire stripper and electrician knife Equipment • Heat gun and soldering iron PPE • Working dress, safety gloves, safety boots, safety helmet, mouth mask and safety goggles

DOMESTIC WIRING BQF CERTIFICATE-II

Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Carrying out domestic wiring		
Module Code	7411- L2-M3		
Learning Outcome 2	Perform domestic building wiring		
Duration	Theory:9 hours	Practical:45 hours	Total: 54 hours
Assessment Criteria	- PVC casing capping wiring for 2 lighting loads is performed as per the standard procedures - PVC conduit wiring for two lighting and one power load is performed as per the standard procedures - MS conduit wiring for three lighting and one power load is performed as per the standard procedures - Concealed conduit is laid as per the standard procedures - Stair case wiring is performed as per the standard procedures - Hostel wiring is performed as per the standard procedures - Call bell wiring is performed as per the standard procedures - Go-down wiring is performed as per the following procedures - Corridor wiring is performed as per the following procedures		
Content	C2.01 Performing PVC casing capping wiring for 2 lighting loads Knowledge - Introduction to house wiring - Electrical signs and symbols - Types of wiring and its application - Installation rules - Advantages and disadvantages of different types of wiring - Differences between surface and concealed wiring - Types of protective switchgears - Types of sub-circuit - Types of switches - Types of sockets - Types of holders - Types of luminaries/lamps - Colour coding of wire - Size of wires and rating - Different size of casing capping bit and its accessories - Importance of pre-installation test Skills - Wire drawing skills - Using spirit level - Using drilling machines - Interpreting circuit diagram - Numeracy skills Attitude, safety and environmental concern - Having integrity and work ethics - Being efficient in using resources - Proper handling and storage of tools and materials - Ensuring to follow OHS rules and regulations		

	• Ensuring appropriate use of PPE • Ensuring proper disposal of waste C2.02 Performing PVC conduit wiring for 2 lightings and 1 power load Knowledge • Introduction to PVC conduit wiring • Advantages and disadvantages of PVC conduit wiring • Application of PVC conduit wiring • Types of PVC conduit fitting • Importance of pre-installation test Skills • Interpreting drawings • Using drilling machine • Using IR tester • Using spirit level • Wire drawing skills • Observation skills • Numeracy skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Proper storage and handling of tools and materials • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C2.03 Performing MS conduit wiring for 3 lighting and 1 power load Knowledge • Introduction to MS conduit wiring • Advantages and disadvantages of MS conduit wiring • Application of MS conduit wiring • Types of MS conduit fitting • Importance of pre-installation test Skills • Interpreting drawings • Using drilling machine • Using spirit level • Wire drawing skills • Observation skills • Numeracy skills Attitude, safety and environmental concern • Being efficient in using resources • Being able to work in confined areas • Having integrity and work ethics • Proper storage and handling of tools and materials • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE
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	• Ensuring proper disposal of waste C2.04 Laying concealed conduit Knowledge • Types of materials used for concealed wiring • Advantages and disadvantages of concealed wiring • Application of concealed wiring Skills • Interpreting drawings • Using drilling machine • Using spirit level • Wire drawing skills Attitude, safety and environmental concern • Being efficient in using resources • Being able to work in confined areas • Having integrity and work ethics • Proper storage and handling of tools and materials • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to maintain chipping depth as per the size of conduit C2.05 Performing staircase wiring Knowledge • Application of staircase wiring Skills • Using insulation resistance (IR) tester • Using spirit level • Using drilling machine • Interpreting drawing • Wire drawing skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C2.06 Performing hostel wiring Knowledge • Application of hostel wiring Skills • Using insulation resistance (IR) tester • Using spirit level • Using drilling machine • Interpreting drawing • Wire drawing skills
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	<i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C2.07 Performing call bell wiring <i>Knowledge</i> • Application of call bell wiring • Types of call bell <i>Skills</i> • Using insulation resistance (IR) tester • Using spirit level • Using drilling machine • Interpreting drawing • Wire drawing skills <i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C2.08 Performing go-down wiring <i>Knowledge</i> • Application of go-down wiring <i>Skills</i> • Using insulation resistance (IR) tester • Using spirit level • Using drilling machine • Interpreting drawing • Wire drawing skills <i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C2.09 Performing corridor wiring <i>Knowledge</i> • Application of corridor wiring <i>Skills</i> • Using insulation resistance (IR) tester • Using spirit level • Using drilling machine • Interpreting drawing
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	• Wire drawing skills <i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Hacksaw blade, pencil/chalk, casing capping & fittings, MCBs, RCCB, PVC wire, batten holders, power socket, modular boxes, switches, bulb, PVC conduit and fittings, DB, screws, dowels, machine screws, drill bits, energy meter, casing capping nail, MS conduit & fittings, insulation tape, saddles, fish wire, call bell, wire joint connector and binding wire Tools • Pliers, screwdriver set, hammer, electrician knife, hacksaw frame, neon tester, spirit level, measuring tape, plumb bob, file, chisels and reamer Instrument • IR tester Equipment • Bench vice, drilling machine and ladder PPE • Working dress, safety gloves, safety boots, safety helmet, safety goggles, safety harness, mouth mask and reflective vest
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity

DOMESTIC WIRING BQF CERTIFICATE-II

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Carrying out domestic wiring		
Module Code	7411- L2-M3		
Learning Outcome 3	Perform installation test		
Duration	Theory:6 hours	Practical:15 hours	Total: 21 hours
Assessment Criteria	• Insulation resistance (IR) test is performed as per the standard procedures • Continuity test is performed as per the standard procedures • Polarity test is performed as per the standard procedures • Earth continuity test is performed as per the standard procedures • Earth resistance test is performed as per the standard procedures • Earth resistivity test is performed as per the standard procedures		
Content	C3.01 Performing IR test Knowledge • Function of IR tester • Purpose of IR test • Standard IR value of domestic building wiring Skills • Using insulation resistance (IR) tester • Observation skills • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring correct selection of test voltage C3.02 Performing continuity test Knowledge • Purpose of continuity test Skills • Using insulation resistance (IR) tester • Analytical skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring correct selection of test voltage C3.03 Performing polarity test Knowledge • Purpose of polarity test Skills • Using insulation resistance (IR) tester • Analytical skills		

	<i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C3.04 Performing earth continuity test <i>Knowledge</i> • Purpose of checking earth continuity <i>Skills</i> • Using insulation resistance (IR) tester • Observation skills • Analytical skills <i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring correct selection of test voltage • Ensuring proper disposal of waste C3.05 Performing earth resistance test <i>Knowledge</i> • Purpose of earth resistance test • Standard earth resistance for domestic installations • Methods of testing earth resistance <i>Skills</i> • Using earth tester • Analytical skills <i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C3.06 Performing earth resistivity test <i>Knowledge</i> • Purpose of earth resistivity test • Calculation of earth resistivity • Methods of earth resistivity test <i>Skills</i> • Using earth tester • Observation skills • Analytical skills • Numeracy skills
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	<i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Wires, probes, test lamp and insulation tape Tools • Pliers, screwdriver, hammer and measuring tape Instrument • Insulation resistance tester and earth tester PPE • Working dress and safety boots
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning

DOMESTIC WIRING BQF CERTIFICATE-II

Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work
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DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Carrying out domestic wiring		
Module Code	7411- L2-M3		
Learning Outcome 4	Troubleshoot electrical fitting		
Duration	Theory:4 hours	Practical:11 hours	Total: 15 hours
Assessment Criteria	• Troubleshooting of LED and fitting is performed as per the standard procedures • Troubleshooting of ceiling fan and fitting is performed as per the standard procedures • Socket faults are troubleshot as per the standard procedures		
Content	C4.01 Troubleshooting LED fault Knowledge • Types of LED fittings • Working principle of LED • Advantages and disadvantages of LED • Symptoms, causes and remedies of faults in LED Skills • Observation skills • Using soldering iron • Using multimeter • Using test lamp Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C4.02 Troubleshooting ceiling fan and fitting Knowledge • Types of fan • Function of fan components • Working principle of fan • Symptoms, causes and remedies of faults in a fan Skills • Using multimeter • Interpreting circuit diagram • Communication skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste C4.03 Troubleshooting socket fault Knowledge • Types of socket		

	• Circuit connection of socket • Rating of switch Skills • Using multimeter • Interpreting circuit diagram • Analytical skills • Observation skills Attitude, safety and environmental concern • Having integrity and work ethics • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Wires, test lamp, switch, socket, LED fittings, lead, screw and fan accessories Tools • Plier, electrician knife, wire stripper, screwdriver, hammer and neon tester Instrument • Multimeter Equipment • AC power supply, ladder and soldering iron PPE • Working dress, safety gloves, safety boots, safety helmet, safety goggles, safety harness, mouth mask and reflective vest
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity

DOMESTIC WIRING BQF CERTIFICATE-II

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

DOMESTIC WIRING BQF CERTIFICATE-II

Module Title	Carrying out domestic wiring		
Module Code	7411- L2-M3		
Learning Outcome 5	Estimate materials		
Duration	Theory:3 hours	Practical:51 hours	Total: 54 hours
Assessment Criteria	- Materials for PVC casing and capping wiring is estimated as per the standard procedures - Materials for conduit wiring is estimated as per the standard procedures - Materials for concealed wiring is estimated as per the standard procedures		
Content	C5.01 Estimating materials for PVC casing and capping wiring Knowledge - Introduction to estimation and costing - Purpose of estimation and costing - Methods of estimation and costing Skills - Interpreting drawings - Interpreting Bhutan Schedule of Rate (BSR) and Labour and Material Coefficient (LMC) - Observation skills - Numeracy skills - Analytical skills Attitude, safety and environmental concern - Having integrity and work ethics - Being efficient in using resources - Ensuring proper disposal of waste C5.02 Estimating materials for conduit wiring Knowledge - Rules for estimation Skills - Interpreting drawings - Interpreting BSR and LMC - Observation skills - Numeracy skills - Analytical skills Attitude, safety and environmental concern - Having integrity and work ethics - Being efficient in using resources - Ensuring proper disposal of waste C5.04 Estimating materials for concealed wiring Knowledge - Rules for estimation Skills - Interpreting drawings - Observation skills - Numeracy skills - Analytical skills		

	<i>Attitude, safety and environmental concern</i> • Having integrity and work ethics • Being efficient in using resources • Ensuring proper disposal of waste • Ensuring to follow OHS rules and regulations
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Drawing, BSR and LMC Tools Calculator PPE • Working dress and safety boot
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity
Instructional Methodologies	The trainer shall use <i>inter alia</i> , the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i> , the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

MODULE 4
ON
CARRYING OUT INSTALLATION OF SECURITY AND COMMUNICATION SYSTEM

MODULE INFORMATION

Occupation	Domestic Wiring Technician
Competency Area	Carry out installation of security and communication system
Module Title	Carrying out installation of security and communication system
Module Code	7411- L2-M4
Module Description	This module is structured to provide learners with the knowledge, skills and right attitude required to install and test security and communication system
Nominal Duration	89.5 Hours
Certificate Level	BQF Certificate Level 2
Pre-requisite	Completed Module 7411-L2-M3
Learning Outcome	1.Install security system 2.Install communication system 3.Test security and communication system wiring 4.Set up audio and visual system

Module Title	Carrying out installation of security and communication system		
Module Code	7411- L2-M4		
Learning Outcome 1	Install security system		
Duration	Theory: 5.5 hours	Practical:27 hours	Total: 32.5 hours
Assessment Criteria	• BNC connector is prepared as per standard procedures • CCTV system is installed as per standard procedures • Burglar alarm is installed as per standard procedures • Hooter/siren is installed as per standard procedures • Fire alarm system is installed as per standard procedures		
Content	D1.01 Preparing Bio-Net Connector (BNC) Knowledge • Types of BNC • Application of BNC • Types of coaxial cable • Constructional parts of BNC • Constructional parts of coaxial cable • Importance of using BNC Skills • Using BNC crimping tool • Wire peeling skills • Observation skills Attitude, safety and environmental concern • Having integrity and work ethics • Proper handling and storage of tools and materials • Being efficient in using resources • Ensuring to follow OHS rules and regulations • Ensuring correct use of PPE • Ensuring proper disposal of waste. • Ensuring to be cautious while stripping the insulation D1.02 Installing analog CCTV Knowledge • Definition of security system • Types of security system • Types of CCTV system • Applications of CCTV • Components of analog CCTV system and its function • Types & features of CCTV camera • Importance of security system • Consequences of inappropriate selection and location of camera Skills • Interpreting drawing/user manual • Using multimeter • Using drilling machine • Observation skills • Analytical skills Attitude, safety and environmental concern • Being efficient in using resources		

	• Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulations • Ensuring correct use of PPE • Ensuring proper disposal of waste D1.03 Installing digital CCTV Knowledge • Components of digital CCTV system and its function • Advantages and disadvantages of digital CCTV Skills • Interpreting drawing/user manual • Using multimeter • Using drilling machine • Observation skills • Analytical skills Attitude, safety and environmental concern • Being time conscious • Being team player • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulations • Ensuring correct use of PPE • Ensuring proper disposal of waste D1.04 Installing burglar alarm Knowledge • Definition of burglar Alarm • Components of burglar alarm • Types of burglar alarm system • Types of alarms and sensors • Alarm circuit diagram Skills • Interpreting drawing/user manual • Using multimeter • Using drilling machine • Observation skills • Analytical skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulations • Ensuring correct use of PPE • Ensuring proper disposal of waste D1.05 Installing hooter/siren Knowledge • Definition of hooter & siren
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	• Types of hooter & siren • Application of hooter & siren Skills • Interpreting drawing/user manual • Using multimeter • Using drilling machine • Observation skills • Analytical skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools and materials • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensure proper handling of siren/hooter • Ensuring proper disposal of waste D1.06 Installing fire alarm Knowledge • Definition of fire alarm • Types of fire alarm system • Types of sensors and detectors • Selection of fire alarm location Skills • Using drilling machine • Observation skills • Analytical skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools and materials • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste
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Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Cable, PVC conduit/casing & capping, drill bits, saddles, BNC connector, cable tag, RJ45 connector, wires, connectors, screws, dowel, coaxial cable, patch cord/panel and insulation tape Tools • Crimping tools, pliers, coaxial cable stripper, screw driver set, measuring tape, electrician knife and hammer Instrument • Multimeter Equipment • Television/display, digital video recorder, DC power supply unit, camera, IP camera, siren, hooter, burglar alarm, control unit, sensors, UPS, drilling machine, fire alarm, detectors, POE switch, NVR, DVR, hard disk and ladder PPE • Working dress, safety gloves, safety boots, safety helmet, safety goggles, safety harness, mouth mask and reflective vest
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning

Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work
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Module Title	Carrying out installation of security and communication system		
Module Code	7411- L2-M4		
Learning Outcome 2	Install communication system		
Duration	Theory:5 hours	Practical:16 hours	Total: 21 hours
Assessment Criteria	• LAN cable is prepared as per standard procedures • I/O box is installed as per the standard procedures • Balun plug is prepared as per the standard procedures • RF connector is prepared as per standard procedures. • TV socket is installed as per the standard procedures		
Content	D2.01 Preparing Local Area Network (LAN) cable Knowledge • Definition of communication system • Types of communication system • Types of communication cable • Difference between RJ11 & RJ45 connector • Function of individual pins • Types of LAN cable connection • Type of LAN cable • Application of LAN cable • Application of cross and straight-thru connection Skills • Using LAN cable tester • Using LAN cable crimping tool • Cable peeling skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulations • Ensuring correct use of PPE • Ensuring proper disposal of waste D2.02 Installing I/O box Knowledge • Colour coding of modular jack • Purpose of I/O box Skills • Using impact tool • Using cable cutter Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulations • Ensuring correct use of PPE • Ensuring proper disposal of waste		

	D2.03 Preparing balun plug Knowledge • Types of coaxial cable • Types of balun plug • Application of balun plug Skills • Using multimeter • Using wire stripper Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over tightening of screw D2.04 Connecting Radio Frequency (RF) connector Knowledge • Types of RF connector • Purpose of RF connector • Application of RF connector Skills • Using crimping tool Attitude, safety and environmental concern • Having integrity and work ethics • Proper handling and storage of tools • Efficient use of materials • Ensuring to follow OHS rules and regulations • Ensuring correct use of PPE • Ensuring proper disposal of waste. • Ensuring to be cautious while stripping the insulation. D2.05 Installing TV socket Knowledge • Standard installation rules Skills • Analytical skills • Communications skills Attitude, safety and environmental concern • Having integrity and work ethics • Proper handling and storage of tools • Efficient use of materials • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste • Ensuring to avoid over tightening
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Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop/practical field Materials • LAN cable, RJ45 connector, I/O box, screws, dowels, drill bit, coaxial cable, balun plug, RF connector, insulation tape and TV socket Tools • Pliers, impact tool, electrician knife, screw driver set, coaxial cable stripper, measuring tape, LAN tester and crimping tool Instruments • Multimeter PPE • Working dress, safety gloves, safety boots, safety helmet, safety goggles, safety harness, mouth mask and reflective vest
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out installation of security and communication system		
Module Code	7411- L2-M4		
Learning Outcome 3	Test security and communication system		
Duration	Theory:7 hours	Practical:14 hours	Total: 21 hours
Assessment Criteria	● BNC connector is tested as per the standard procedures ● Modular jack is tested as per standard procedures ● LAN Cable is tested as per standard procedures ● Fire alarm is tested as per the standard procedures ● Burglar alarm is tested as per the standard procedures ● CCTV is tested as per the standard procedures		
Content	D3.01 Testing BNC connector Knowledge ● Purpose of testing BNC connector and coaxial cable Skills ● Using multimeter Attitude, safety and environmental concern ● Being efficient in using resources ● Having integrity and work ethics ● Proper handling and storage of tools ● Ensuring to follow OHS rules and regulations ● Ensuring correct use of PPE ● Ensuring proper disposal of waste D3.02 Testing modular jack Knowledge ● Purpose of testing modular jack Skills ● Using cable tester Attitude, safety and environmental concern ● Being efficient in using resources ● Having integrity and work ethics ● Proper handling and storage of tools ● Ensuring to follow OHS rules and regulations ● Ensuring correct use of PPE ● Ensuring proper disposal of waste D3.03 Testing LAN cable Knowledge ● Purpose of testing LAN cable Skills ● Using LAN tester Attitude, safety and environmental concern ● Being efficient in using resources ● Having integrity and work ethics ● Proper handling and storage of tools ● Ensuring to follow OHS rules and regulations ● Ensuring correct use of PPE ● Ensuring proper disposal of waste		

	D3.04 Testing fire alarm Knowledge ● Purpose of smoke detector ● Types of smoke detector ● Types of fire alarm ● Purpose of fire alarm ● Problems associated with the smoke detector ● Purpose of testing fire alarm Skills ● Operating fire detector Attitude, safety and environmental concern ● Being efficient in using resources ● Having integrity and work ethics ● Efficient use of materials ● Ensuring to follow OHS rules and regulations ● Ensuring appropriate use of PPE ● Ensuring proper disposal of waste D3.05 Testing burglar alarm Knowledge ● Purpose of testing burglar alarm Skills ● Operating burglar alarm system Attitude, safety and environmental concern ● Being efficient in using resources ● Having integrity and work ethics ● Efficient use of materials ● Ensuring to follow OHS rules and regulations ● Ensuring appropriate use of PPE ● Ensuring proper disposal of waste ● Ensuring proper system configuration D3.06 Testing analog CCTV Knowledge ● Purpose of testing analog CCTV system Skills ● Operating CCTV system Attitude, safety and environmental concern ● Being efficient in using resources ● Having integrity and work ethics ● Efficient use of materials ● Ensuring to follow OHS rules and regulations ● Ensuring appropriate use of PPE ● Ensuring proper disposal of waste D3.07 Testing digital CCTV Knowledge ● Purpose of testing digital CCTV system Skills ● Operating CCTV system
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	<i>Attitude, safety and environmental concern</i> • Being efficient in using resources • Having integrity and work ethics • Efficient use of materials • Ensuring to follow OHS rules and regulations • Ensuring appropriate use of PPE • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • BNC Connector, coaxial cable, matches, fuel, wires, LAN cable, RJ45 connector, patch code cable, cable tester and modular jack Tools • Pliers and screwdriver set Instrument • Multimeter Equipment • Burglar alarm system and fire alarm system PPE • Working dress, safety gloves, safety boots, safety helmet, safety goggles, safety harness, mouth mask and reflective vest
Underpinning skills	• Teamwork • Communication • Problem solving • Interpersonal relationship • Time management • Creativity

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out installation of security and communication system		
Module Code	7411- L2-M4		
Learning Outcome 3	Set up audio visual system		
Duration	Theory:3 hours	Practical:12 hours	Total: 15 hours
Assessment Criteria	• Audio system is set up as per the standard procedures • Visual system is set up as per standard procedures • Performance is tested as per standard procedures		
Content	D4.01 Setting up audio system Knowledge • Balanced vs unbalanced audio, cables and connectors • Types of equipment • Functions of equipment Skills • Analytical skills • Problem solving skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulations • Ensuring correct use of PPE • Ensuring proper disposal of waste D4.02 Setting up visual system Knowledge • Components of visual system • Line connection for setting up visual system • Common faults in setting up visual system Skills • Using drilling machine • Using multimeter • Observation skills Attitude, safety and environmental concern • Being efficient in using resources • Having integrity and work ethics • Proper handling and storage of tools • Ensuring to follow OHS rules and regulations • Ensuring correct use of PPE • Ensuring proper disposal of waste D4.03 Testing performance of AV system Knowledge • Common installation problems • Process of configuring and Optimizing the Settings Skills • Using multimeter Attitude, safety and environmental concern • Being efficient in using resources		

	● Having integrity and work ethics ● Proper handling and storage of tools ● Ensuring to follow OHS rules and regulations ● Ensuring correct use of PPE ● Ensuring proper disposal of waste
Learning Conditions	Learning Materials ● Competency Based Learning Materials (CBLM) ● Hand-outs ● Audio Visuals ● Reference books ● Manuals Learning facilities and infrastructure ● Classroom with adequate facilities ● Information Technology (IT) lab ● Library ● Workshop Materials ● Pen, pencil, notebook, speaker cable, speak-on cables, HDMI cable, pointer, TV remote and projector screen Tools ● Screw driver set, hammer, wire stripper, plier, measuring tape, spirit level and Allen key Instrument ● Multimeter Equipment ● Ladder, drilling machine, cordless power tool, Computer, Handheld Microphone, charger, XLR cables, Mixing console, Cross over, Mixer, Amplifier, Quarter inch Jack, Low frequency speakers (Sub-woofer), High frequency speakers, outboard rack, Microphone stands, projector with mounting accessories, TV/monitor with mounting accessories and cordless power tool PPE ● Working dress, safety gloves, safety boots, safety helmet, safety goggles, safety harness, mouth mask and reflective vest
Underpinning skills	● Teamwork ● Communication ● Problem solving ● Interpersonal relationship ● Time management ● Creativity

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

ON-THE-JOB TRAINING (OJT)

COURSE	Domestic wiring BQF Certificate-2
DESCRIPTION	The trainee will be attached with relevant industries for OJT program. During the OJT, the trainees will be exposed to real life working environment where they are expected to develop technical skills and learn positive working attitudes including life skills.
OBJECTIVE	After completion of OJT, learners will be able to • Develop critical thinking, creativity, collaboration and communication skills • Develop information, media and technology literacy • Adopt flexible and productive working attitude • Develop leadership skills • Apply initiatives • Develop social skills • Adopt OHS practices • Carry out installation of panel board • Carry out domestic wiring • Carry out installation of security and communication system
DURATION	408 Hours
CONDITIONS FOR OPERATION OF OJT	• The institute shall select relevant and reliable industry for OJT attachment • The trainee shall be attached in Digital and Precision technology related activity for at least 70% of the total OJT duration • The industry shall maintain daily attendance of the trainee • The trainee shall maintain OJT logbook as per the OJT guideline • The trainee is required to follow company's rule • The collaborating industry shall provide working facilities • The industry shall assess performance of trainees • The industry shall provide feedback in the logbook

DOMESTIC WIRING BQF CERTIFICATE-II

EVALUATION	The industry shall evaluate the trainees on the trainee's performance through observation and use of logbook. The evaluation shall be done on the following aspects of trainees: ➤ Core skills ➤ Critical thinking ➤ Creativity ➤ Collaboration ➤ Communication ➤ Information literacy ➤ Media literacy ➤ Conversant to up-to-date technology ➤ Flexibility ➤ Leadership ➤ Initiative ➤ Productivity ➤ Social skills
REPORT	The trainee shall submit comprehensive report on OJT to the Institute

What is Competency-Based Curriculum (CBC)

- ✓ A competency-based curriculum is a framework or guide for the subsequent detailed development of competencies, associated methodologies, training and assessment resources.
- ✓ The CBC specifies the outcomes which are consistent with the requirements of the workplace as agreed through the industry or community consultations.
- ✓ CBC can be developed immediately when competency standards exist.
- ✓ When competency standards do not exist, curriculum developers need to clearly define the learning outcomes to be attained. The standard of performance required must be appropriate to industry and occupational needs through the industry/enterprise or specified client group consultations.

The CBC materials are available in both printed and electronic copies.

Annex I: Time Distribution

Time Distribution					
Domestic Wiring BQF Certificate-2					
Module	Learning outcomes	Tasks	Theory (hours)	Practical (hours)	Total (hours)
A: Apply fundamentals of electricity	A1 Apply basic electrical theory	A1.00 Introductory Knowledge	1	0	1
		A1.01 Test conductor and insulator	1	3	4
		A1.02 Perform instrument reading	1	4	5
		A1.03 Measure resistance	1	2	3
		A1.04 Measure voltage	1	2	3
		A1.05 Measure current	1	2	3
		A1.06 Measure power	1	2	3
		A1.07 Measure frequency	1	2	3
		A1.08 Measure energy	2	4	6
	Sub Total		10	21	31
	A2 Verify DC circuits	A2.01 Verify Ohm's Law	2	4	6
		A2.02 Verify characteristics of series circuit	2	4	6
		A2.03 Verify the characteristic of parallel circuits	2	4	6
		A2.04 Verify the characteristics of series-parallel combined circuit	2	4	6
		A2.05 Verify Kirchhoff's current Law	2	4	6
		A2.06 Verify Kirchhoff's voltage Law	2	4	6
	Sub Total		12	24	36
	A3 Verify AC circuits	A3.01 Verify the characteristics of A.C and D.C	2	2	4
		A3.02 Check phase sequence of 3 ϕ supply	1	1	2
		A3.03 Verify the characteristic of balanced and unbalanced load in star connection	1	5	6
		A3.04 Verify the characteristics of balance delta load connection	1	5	6
	Sub Total		5	13	18
	A4 Apply basic electronics theory	A4.01 Test inductor	1	2	3
		A4.02 Test capacitor	1	2	3
		A4.03 Test diode	1	2	3
		A4.04 Test Zener diode	1	2	3
		A4.05 Test transistor	1	2	3
	Sub Total		5	10	15
			32	68	100
B: Carryout installation of panel board	B1: Install protective devices for single phase	B1.01 Install distribution board for 1 ϕ	1	1.5	2.5
		B1.02 Install Miniature Circuit Breaker for 1 ϕ	1	1.5	2.5
		B1.03 Install Residual Current Circuit Breaker for 1 ϕ	1	1.5	2.5

		B1.04 Install Earth Leakage Circuit Breaker for 1 ϕ	1	1.5	2.5
		B1.05 Install change over switch for 1 ϕ	1	1.5	2.5
	Sub Total		5	7.5	12.5
	B2: Install protective devices for three phase	B2.01 Install bus bar	1	1.5	2.5
		B2.02 Install distribution board for 3 ϕ	1	1.5	2.5
		B2.03 Install Miniature Circuit Breaker for 3 ϕ	0.5	1.5	2
		B2.04 Install Residual Current Circuit Breaker for 3 ϕ	0.5	1.5	2
		B2.05 Install Earth Leakage Circuit Breaker for 3 ϕ	0.5	1.5	2
		B2.06 Install Molded Case Circuit Breaker	0.5	1.5	2
		B2.07 Install change over switch for 3 ϕ	0.5	1.5	2
	Sub Total		4.5	10.5	15
	B3: Install earthing and lightning arrester	B3.01 Install plate earthing	2	10	12
		B3.02 Install pipe earthing	1	11	12
		B3.03 Install slab earthing	1	11	12
		B3.04 Install chemical earthing	1	11	12
		B3.05 Install building LA	1	5	6
	Sub Total		6	48	54
			15.5	66	81.5
C: Carryout domestic wiring	C1 Prepare wire joints	C1.01 Prepare rat tail joint	0.5	1	1.5
		C1.02 Prepare T-Joint	0.5	1	1.5
		C1.03 Prepare straight joint	0.5	1	1.5
		C1.04 Prepare married joint	0.5	1	1.5
	Sub Total		2	4	6
	C2 Perform lighting and power circuit wiring	C2.01 Perform PVC Casing Capping wiring for 2 lighting loads	1	5	6
		C2.02 Perform PVC Conduit wiring for 2 lighting & 1 power loads	1	5	6
		C2.03 Perform MS conduit wiring for 3 lighting and 1 power load	1	5	6
		C2.04 Lay concealed conduit	1	5	6
		C2.05 Perform staircase wiring	1	5	6
		C2.06 Perform hostel wiring	1	5	6
		C2.07 Perform call bell wiring	1	5	6
		C2.08 Perform go-down wiring	1	5	6
		C2.09 Perform corridor wiring	1	5	6
	Sub Total		9	45	54
	C3 Perform installation test	C3.01 Perform IR test	1	2	3
		C3.02 Perform continuity test	1	2	3
		C3.03 Perform polarity test	1	2	3
		C3.04 Perform earth continuity test	1	2	3
		C3.05 Perform earth resistance test	1	2	3
		C3.06 Perform earth resistivity test	1	5	6

	Sub Total		6	15	21
	C4 Troubleshoot electrical fittings	C4.01 Troubleshoot LED fault	2	4	6
		C4.02 Troubleshoot ceiling fan and fitting	1	5	6
		C4.03 Troubleshoot socket fault	1	2	3
	Sub Total		4	11	15
	C5 Estimate materials	C5.01 Estimate materials for PVC Casing capping wiring	1	17	18
		C5.02 Estimate materials for conduit wiring	1	17	18
		C5.03 Estimate materials for concealed wiring	1	17	18
	Sub Total		3	51	54
			24	126	150
D: Carry out installation of security and communication system	D1 Install security system	D1.01 Prepare BNC connector	0.5	2	2.5
		D1.02 Install analog CCTV	1	5	6
		D1.03 Install digital CCTV	1	5	6
		D1.04 Install burglar alarm system	1	5	6
		D1.05 Install hooter/siren	1	5	6
		D1.06 Install fire alarm system	1	5	6
	Sub Total		5.5	27	32.5
	D2 Install communication system	D2.01 Prepare LAN cable	1	5	6
		D2.02 Install I/O box	1	5	6
		D2.03 Prepare Balun plug	1	2	3
		D2.04 Connect RF connector	1	2	3
		D2.05 Install TV socket	1	2	3
	Sub Total		5	16	21
	D3 Test security and communication system wiring	D3.01 Test BNC connector	1	2	3
		D3.02 Test modular jack	1	2	3
		D3.03 Test LAN cable	1	2	3
		D3.04 Test fire alarm system	1	2	3
		D3.05 Test burglar alarm system	1	2	3
		D3.06 Test analog CCTV system	1	2	3
		D3.07 Test digital CCTV system	1	2	3
	Sub Total		7	14	21
	D4 Perform audio Visual system	D4.01 Set up audio system	1	5	6
		D4.02 Set up visual system	1	5	6
		D4.03 Test performance of AV system	1	2	3
	Sub Total		3	12	15
			20.5	69	89.5
			92	329	421

Annex II: Assessment Sample

Unit of competency	
Unit Code	
Module Title	
Module Code	
Time Duration	
Problem or Project:	
Introduction:	
Observation: (How will you be assessed as Competent?) •	
Note: For Assessor/Institute for preparation for assessment. Materials and Equipment for 1 candidate • Roles and responsibilities of assessors (before/during and after assessment) •	

Assessor/ Observation Check List

Unit of competency			
Unit Code			
Module Title			
Module Code			
Problem/Project:			
Candidate's Name:			
Place of Assessment:		Date of Assessment:	
A. During the demonstration of skills did the candidate do following:	Marks allocated	Marks received	Remarks
B. Is the job outcome correct in the following areas?			
Total marks obtained			
The Candidate's performance	Satisfactory:		
	Not Satisfactory:		

Oral Questions checklist:

Unit of competency				
Unit Code				
Module Title				
Module Code				
Problem/Project:				
Candidate's Name:				
Place of Assessment:		Date of Assessment:		
Questions (and its domain level) to be answered by the trainee / candidate:	Key Answer	Marks allocated	Marks obtained	Remarks
Total Marks Obtained				
The candidate's performance was:		Satisfactory:		
		Not Satisfactory:		
Assessor's Name:		Signature:		

Written questions checklist:

Unit of competency			
Unit Code			
Module Title			
Module Code			
Problem/Project: Drive Light Vehicle			
Candidate's Name:			
Place of Assessment:		Date of Assessment:	
Questions (and its domain level) to be answered by the trainee/ candidate:	Key Answer	Marks Allocated	Marks Obtained
Total marks obtained			
The Candidate's performance was:		Satisfactory:	
		Not Satisfactory:	
Assessor's Name:		Signature:	
The Candidate's overall result:	Competent:		
	Not Yet Competent:		
Feedback to Candidate:			
(Provide feedback to the candidate on how they could improve – especially if they are not competent)			
I am satisfied with the way assessment was conducted: (Please include reasons if not satisfied)		YES	NO
Candidate Name:			
Signature:			
Date:			

Assessor Name:**Signature:****Training Provider:****Date:**

Annex III: Module Recognition

This is to verify that

Mr/Ms.....

has completed module on

.....

Covering following learning outcomes:

1.
2.
3.

Instructor:

Head of the Department:

.....

.....

Signature:

Signature:

Date: / / (dd/mm/yyyy)
.....(dd/mm/yyyy)

Date: / /

Head of the Institute:

Trained Assessor (Institute)/Exam OC:

.....

.....

Signature:

Signature:

Date: / ... / (dd/mm/yyyy)

Date: / /(dd/mm/yyyy)

Annex IV : Lesson Plan

Lesson Plan

Course Title:				NC Level:
Module Code:				Duration:
Module Title:				
Learning Outcome:				
Skill/Task/Topic:				
Terminal Performance Objective:				
<i>(Note: Write narrative statement extracted from TPO of Task Sheet)</i>				
Enabling Objectives (Related knowledge):				
<i>By the end of the lesson learners will be able to:</i>				
i) ii) iii)				
What (Content/Activity)	Who (T/L)	How (Methods/ Media)	Duration (Min.)	Questions
Introduction:				
Main body				
Conclusion				
Projects/Problems:				

Instructional Resources Plan				
Skills/Task/Topic:				
No. of Trainees:				
Sl. No.:	Instructional materials/resources	Specifications	Qty.	Remarks
Prepared by :		Signature	Date:	
Revised by:		Signature	Date:	
Approved by:		Signature	Date:	

Task sheet

TS-1/4: Practical Plan			
Course Title:			N C Level:
Module code:			Duration:
Module Title			
Learning outcome			
Skills/Task Title:			Task no:
Terminal Performance Objective: <i>Given:</i> <i>Cue:</i> <i>Who:</i> <i>What:</i> <i>Within:</i> <i>How well:</i> - - -			
Enabling Objectives (Related Skills): <i>By the end of a lesson, the learners will be able to:</i> i) ii) iii) iv)			
Activities	Who (T/L)	How (methods/ media)	Duration
Project/Assignment: 			

DOMESTIC WIRING BQF CERTIFICATE-II

TS-2/4: Tool and Equipment required:						
Sl no.	Particulars	Specifications	Qty.	Remarks		
Training Materials required:						
Sl no.	Particulars	Specifications	Qty.	Rate	Amount	Remarks
TS-3/4: Performance Guide						
Skill/Task:					Date:	
Directions: Use the following performances criteria to rate the learner. Check YES/NO to indicate whether the learner performed each step as indicated or not?						
Sl. No:	Steps				Yes	No
Note: Critical steps: All * marked steps should be carried out very carefully. For a quality performance guide, all items should be checked "YES"						

TS-4/4: Instruction and Drawing	
General Instructions for Trainees i) ii)	

DOMESTIC WIRING BQF CERTIFICATE-II

- iii)
- iv)

Drawing (if any)

Safety Precaution

- i)
- ii)
- iii)

Prepared by :	Signature	Date:
Revised By:	Signature	Date:
Approved by :	Signature	Date:

Annex V: Course Plan
Institutes letter head and Logo

(Trade)YEAR PLAN- _____ Semester _____ (Year)

Trade: NC Level:			Schedule																																								Total Hours					
Module Code	Module Title	Learning Outcome	Feb.				March				April				May				June				July				Aug.				Sept				Oct.				Nov.									
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4										
OJT																																																
Assessment and Certification																																																

Prepared by:

Verified & Approved by:

Date:

Monthly/Weekly Plan

Month: Trade: Trainer:

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Week 01							
Week 02							
Week 03							
Week 04							
Week 05							

Developed by: Approved by:

Date



For more information please contact:

Technical Trainers Training and Resource Center (TTTRC), DWPSD

P.O. Box153; Gelephu

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