

Vocational Education and Training Award in Principles of Electrical and Electronics Engineering

Applying for this course:

To apply for this course, you should be 16 years of age or older and have a MQF Level 2 in English and either Mathematics or Physics. If you do not have these qualifications but possess other qualifications or relevant experience, kindly contact us on qa.jobsplus@gov.mt stating your ID card number, attaching copies of your qualifications and a copy of your CV highlighting your work experience. Alternatively, you can send the requested information by post addressed to: Quality Assurance Unit, Jobsplus Training Complex, Triq Birżebbuġa, Ғal Far BBG3000.

Course Duration

This course is of 180 hours duration and consists of four Modules:

- Module 1 is of 24 hours duration - (including 2-hour assessment)
- Module 2 is of 37 hours duration - (including 2-hour assessment)
- Module 3 is of 51 hours duration – (including 2-hour assessment)
- Module 4 is of 68 hours duration – (including 4-hour assessment)

General pedagogical guidelines and procedures for this course:

The delivery of this course will be mainly held through a series of discussions and hands-on exercises. The trainer will also be holding lessons with the learners which will consist of various presentations.

General assessment policy and procedures for this course:

The learner will be assessed through a written test. The learner will also undergo an ongoing assessment for learning by way of oral, practical and written exercises that will take place throughout the entire module. The purpose of this assessment for learning will be to review and consolidate the learning being covered.

Module 1 Learning Outcomes – Health and Safety Procedures related to Electronics / Electrical Engineering trade.

<ul style="list-style-type: none">✓ Comply with the electronics / electrical trade's best health and safety practices and procedures✓ Mitigate or reduce the main hazards and risks of working with electricity by applying appropriate precautions before, during and after a given task✓ Implement basic precautionary measures at the place of work to ensure the safety of one's self, the safety of other persons and due care for third parties' property✓ Carry out tasks utilising best industry safe working practices to reduce health hazards when in contact with toxic materials, liquids, dust and fumes✓ Deal with the labelling storage and disposal of hazardous waste materials utilising best industry practices✓ Comply with the RoHS directive✓ Carry out tasks implementing the correct electrical protective devices found in electronic / electrical circuits	<ul style="list-style-type: none">✓ Use correctly and consistently the required protective clothing and equipment✓ Perform proper maintenance of personal protective equipment typically used in the electronics / electrical trade✓ Carry out manual handling operations according to best industry standards✓ Deal with the safe movement of materials and components, observing best industry practice✓ Implement best industry practices when using electrical/soldering equipment✓ Comply with the correct procedures to isolate person/s who is/are in contact with a simulated live electrical supply✓ Deal with basic electrical / electronic industry work bench top minor fires by utilising the appropriate equipment✓ Comply with best industry practices when using, and maintaining equipment✓ Comply with evacuation and emergency procedures
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Module 1 Assessment: The assessment paper is divided into 2 sections:

- Section A – Multiple choice which all need to be answered.
- Section B – Open ended (long answer) questions

The duration of this assessment is of 2 hours and the pass mark is that of 45%.

Module 2 Learning Outcomes – Basic Mathematics and Physics

<ul style="list-style-type: none">✓ Carry out arithmetic operations on algebraic / fractional algebraic expressions and functions on positive and negative numbers✓ Carry out basic arithmetic operations utilising algebraic expressions containing exponents✓ Solve linear equations exercises by correctly transposing appropriate formulae✓ Comply with the characteristics of the trigonometric functions of sine, cosine and tangent when utilised in mathematical operations✓ Produce correct mathematical results utilising the appropriate sine, cosine or tangent functions✓ Carry out mathematical tasks utilising numbers in the different radices or bases for the binary, decimal and hexadecimal mathematical notations✓ Solve simultaneous equations exercises by correctly transposing appropriate formulae✓ Comply with the mathematical rules when dealing with the perimeter, circumference, area or volume of a given object	<ul style="list-style-type: none">✓ Calculate the perimeter, circumference, area and volume of various simple two- and three-dimensional profiles✓ Use a scientific calculator to work out mathematical tasks related to the above learning outcomes✓ Advise about the energy level properties for the various states of matter✓ Carry out tasks utilising the correct standard units for mass, weight and density✓ Carry out mathematical equations in accordance with the basic laws of motion✓ Carry out measuring tasks using suitable measuring instruments, in order to determine various dimensional / electrical parameter ranges✓ Carry out various tasks in full awareness of the Kinetic and Potential energy in a system✓ Deal correctly with the basic principles of energy, work and power✓ Deal correctly with the basic principles of momentum and torque.
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Module 2 Assessment: The assessment paper is divided into 2 sections:

- Section A – Multiple choice which all need to be answered.
- Section B – Multiple choice and calculation questions which all need to be answered.

The duration of this assessment is of 2 hours and the pass mark is that of 45%.

Module 3 Learning Outcomes – Electrical engineering technology

<ul style="list-style-type: none">✓ Carry out tasks in solving electrical circuits calculations utilising Ohm's law✓ Deal correctly with the different electrical terminologies: Work, Power and Energy according to the relevant scenario✓ Employ Kirchoff's Law (current and voltage) in mathematical calculations for given electrical task✓ Deal with solving series / parallel and combined circuits by calculate the resultant electrical values✓ Comply with the characteristics and properties of D.C and A.C. currents when carrying out electrical/electronic work✓ Carry out tasks with D.C. and various A.C. wave forms according to their properties	<ul style="list-style-type: none">✓ Deal correctly with the different electrical terminologies: 'resistance, capacitance, inductance, admittance, conductance and susceptance'✓ Carry out tasks with various R C L circuits, by calculating the voltages, current and related electrical values✓ Select the most suitable testing and measuring electrical instruments' for the particular applications, according to instrument's abilities and dis/advantages✓ Carry out tasks using various types of magnetic circuits according to their specific characteristics and properties✓ Carry out tasks using various types of transformers according to their specific characteristics and properties.
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Module 3 Assessment: The assessment paper will have only 1 section:

- Section A – Multiple choice, calculations and open ended (short answer) questions which all need to be answered.

The duration of this assessment is of 2 hours and the pass mark is that of 45%.

Module 4 Learning Outcomes – Basic Electronics Principles

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| <ul style="list-style-type: none">✓ Carry out tasks involving the precise identification of various electronic components, their values and tolerances✓ Produce drawings utilising the various standard electrical and electronic component circuit symbols✓ Select the appropriate class / types of cables and wires that are utilised in a given electrical / electronic application✓ Apply the correct biasing of semiconductors, in compliance to their specific type✓ Produce circuits with various typical types of P-N junction diodes✓ Build half / full and bridge rectifiers for their required applications✓ Select the type of stabilized d.c. power supplies according to the particular circuit's power requirements✓ Produce accurately biased circuits, utilising the various typical configurations of bipolar junction transistors✓ Produce an inventory of the various different types of boards utilised in the assembly of electronic circuits | <ul style="list-style-type: none">✓ Produce schematic diagrams and utilise them to construct simple electrical and electronic circuits✓ Carry out tasks utilising the correct sequencing of assembly process to construct simple electrical and electronic circuits✓ Carry out the appropriate pre-soldering processes on various electronic components✓ Carry out various types of soldering processes that are most suited to electrically bond different electronic components and solder wires✓ Deal with the inspection of soldering joints, repair 'dry joints and short circuits', to ensure a 'sound soldered' circuit✓ Carry out tasks by utilising instruments that are best suited for measuring and recording various electrical parameters in electrical / electronic circuits✓ Create electronic circuits by utilising various logic gates✓ Handle and mount integrated circuits correctly✓ Carry out tasks utilising the functions of function of Wave form generators✓ Advise about the correct handling and storage of fibre optic cables |
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Module 4 Assessment: The assessment paper will be divided into 2 assessment papers, one written and one practical:

- Paper I (Written 2 hours) – Calculations and open ended (short answer) questions which all need to be answered.
- Paper II (Practical 2 hours) – Hands-on and related open ended (short answer) questions.

The total duration of this assessment is of 4 hours, 2 hours for the Paper I and 2 hours for the Paper II, and the pass mark is that of 45% in each paper.

The Malta Further and Higher Education Authority (MFHEA) deems this certificate to be at Level 3 of the Malta Qualifications Framework and the European Qualifications Framework for Lifelong Learning. This course comprises study modules to which a total of 11 ECVET points are assigned.