Award in Physics and Mathematics for Electrical Fitters

Applying for this course:

To apply for this course, you should have completed compulsory schooling and have a MQF level 1 qualification in Mathematics, English or Maltese language. Individuals who do not possess the entry requirements will be requested to do a pre-assessment to determine the learner's level of competence in Mathematics, English or Maltese. Learners need to successfully pass (45%) a Pre-Assessment Test approved by Jobsplus to be eligible. 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, Ħal Far BBG3000.

Course Duration

This course is of 100 hours duration and consists of four Modules.

- Module 1 is of 16.5 hours duration - (including 1.5-hour assessment)
- Module 2 is of 33.5 hours duration - (including 2-hour assessment)
- Module 3 is of 16.5 hours duration - (including 1.5-hour assessment)
- Module 4 is of 33.5 hours duration - (including 2-hour assessment)

General pedagogical guidelines and procedures for this course:

The delivery of this Unit 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 at the end of each module.

Module 1 Learning Outcomes- **Mathematics I**

✓ Create lists of odd and even numbers from a given number set ✓ Create a list of prime numbers from a given number set; ✓ Carry out mathematical tasks utilising negative numbers in a given context; ✓ Carry out basic arithmetic operations utilising positive and negative whole numbers; ✓ Carry out basic arithmetic operations utilising factors and multipliers ✓ Carry out basic arithmetic operations utilising fractions and decimals and rounding off up to three decimal places; ✓ Deal with the mathematical rules for ratios ✓ Deal with the mathematical rules for proportions ✓ Deal with the mathematical rules pertaining to percentages	✓ Comply with the mathematical rules when dealing with the range, mean, mode and median for a set of given values; ✓ Carry out mathematical tasks on a given set of numbers to determine the range, mean, mode and median values; ✓ Carry out mathematical tasks related to the above learning outcomes utilising a scientific calculator ✓ Ensure the proper International System of Units (SI units) symbols are utilised in a given context; ✓ Carry out tasks utilizing the appropriate Multiples and Sub multiples of the SI Units; ✓ Carry out conversions of units into alternative base standard units of measurement, for the identical quantity, by

✓ Deal with the mathematical rules pertaining to reciprocals ✓ Carry out basic mathematical operations involving ratios, proportions, percentages and reciprocals;	utilising conversion factors, equations, tables and graphs; ✓ Comply with the mathematical rules when dealing with the perimeter, circumference, area or volume of a given object; ✓ Carry out tasks in calculating the perimeter, circumference, area and volume of various simple two and three dimensional profiles.

Module Assessment: The assessment paper will be divided into 1 section:

- Section A – Calculations, which all need to be answered

The duration of this assessment is of 90 minutes and the pass mark is that of 45%.

Module 2 Learning Outcomes- **Mathematics II**

✓ Carry out basic arithmetic operations utilising algebraic expressions and fractional algebraic expressions; ✓ Carry out calculations to find the square roots of numbers and associated applications; ✓ Carry out basic arithmetic operations utilising algebraic expressions containing exponents; ✓ Carry out basic arithmetic operations to solve linear equations and correctly transpose formulae; ✓ Ensure that drawings comply with the properties of different angles where applicable; ✓ Carry out geometric exercises that correctly utilise the properties of angles in circles and polygons;	✓ Comply with the characteristics of the trigonometric functions of sine, cosine and tangent when utilised in mathematical operations; ✓ Ensure that the appropriate sine, cosine or tangent functions are used to arrive at correct mathematical results Carry out mathematical operations utilising Pythagoras' theorem; ✓ Produce a coordinates table for a graph plot as derived from a given equation; ✓ Create accurate graphs by plotting coordinates in all four quadrants of the Cartesian Plane; ✓ Deal with the accurate interpretation of a plan' up/down scaling calculations and correctly transpose measurements onto a given site.

Module Assessment: The assessment paper will be divided into 1 section:

- Section A – Calculations, which all need to be answered

The duration of this assessment is of 120 minutes and the pass mark is that of 45%.

Module 3 Learning Outcomes- **Physics I**

✓ 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; ✓ Deal correctly with the basic principles of force and vectors	✓ Deal correctly with the basic principles of momentum and torque; ✓ Comply with the first law of thermodynamics; ✓ Advise on the correct use of the terms heat and temperature; ✓ Deal correctly with thermal calculations involving the 'specific heat capacity' of matter;

✓ 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 dimension ranges; ✓ Carry out various tasks in full awareness of the Kinetic and Potential energy in a system;	✓ Deal correctly with electrical calculations involving 'temperature coefficient of resistance'; ✓ Carry out tasks by correctly interpreting the recommended illumination specification ranges of 'luminous intensity' for various applications; ✓ Deal with various electrical lighting sources that emit warm and cool light colour hues.

Module Assessment: The assessment paper will be divided into 1 section:

- Section A – Calculations, which all need to be answered

The duration of this assessment is of 90 minutes and the pass mark is that of 45%.

Module 3 Learning Outcomes- **Physics II**

✓ Comply with the basic principles of electricity when undertaking an electrical task; ✓ Ensure that one takes into account the properties of conductors and insulators when working on a given electrical task; ✓ Comply with the principles of resistance and capacitance when undertaking an electrical task; ✓ Carry out tasks using the correct electrical industry SI units and their sub/multiples; ✓ Deal correctly with documentation stating the electrical terminology 'voltage, current, resistance and power'; ✓ Deal with calculations of voltage, current, resistance and power in a electrical circuit having resistors in series or in parallel or a circuit having a combination of both by transposing the appropriate electrical formulae ;	✓ Deal with the mathematical calculations to determine the voltage drop across a circuit conductor; ✓ Comply with the basic principles of magnetism/electro-magnetism when undertaking an electrical task; ✓ Carry out tasks noting the significant differences between Direct current and Alternating current wave forms in a given electrical circuit; ✓ Carry out calculations of Root Mean Square and Average Values of electrical parameters, which are typically used in the trade.

Module Assessment: The assessment paper will be divided into 1 section:

- Section A – Calculations, which all need to be answered

The duration of this assessment is of 120 minutes and the pass mark is that of 45%.

The Malta Further and Higher Education Authority (MFHEA) deems this certificate to be at Level 2 of the Malta Qualifications Framework and the European Qualifications Framework for Lifelong Learning. This course comprises study modules to which a total of 6 ECTS points are assigned.