

Physics and Mathematics for Electrical Fitters

Applying for this course:

To apply for this course, you should be 16 years of age or older and have completed compulsory schooling.

Course Duration

This course is of 60 hours duration and consists of two Modules.

- Module 1 is of 30 hours duration - (including 1-hour assessment)
- Module 2 is of 30 hours duration - (including 1-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**

<ul style="list-style-type: none">✓ 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✓ Deal with the mathematical rules pertaining to reciprocals✓ Carry out basic mathematical operations involving ratios, proportions, percentages and reciprocals;✓ 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;	<ul style="list-style-type: none">✓ 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.✓ 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
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<ul style="list-style-type: none"> ✓ 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 utilising conversion factors, equations, tables and graphs; 	<p>mathematical results Carry out mathematical operations utilising Pythagoras' theorem;</p> <ul style="list-style-type: none"> ✓ 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.
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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 60 minutes and the pass mark is that of 45%.

Module 2 Learning Outcomes- Physics

<ul style="list-style-type: none"> ✓ Carry out tasks utilising the correct standard units for mass, weight and density; ✓ Deal correctly with the basic principles of force and vectors ✓ 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 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; ✓ 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. ✓ Comply with the basic principles of electricity when undertaking an electrical task; 	<ul style="list-style-type: none"> ✓ 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.
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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 60 minutes and the pass mark is that of 45%.