

1. Module details**Module name****Applied Physics Concepts 1****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 54-60 hours.

Module code

NUE091

Discipline code**2. Module purpose**

This module is intended to develop learners understanding of some of the key ideas of physics, the characteristics of physics, and the ways in which physics asks questions about nature; and understanding of how the concepts of physics are used in selected applications.

3. Prerequisites

Nil.

4. Relationship to competency standards

This module partly supports the achievement of competency for units of competency in the National Electrotechnology Training Package Competency Standards. Full competence is achieved through relevant off-job and on-job training as prescribed by the industry for the requisite qualification.

5. Content**1. Motion in two dimensions**

Projectile motion - vertical and horizontal components of velocity, determination of the vertical component of velocity, resolution of velocity into components, time of flight, range, effect of air resistance, *-application: projectiles in sport;*

Uniform circular motion – centripetal acceleration, force causing the centripetal acceleration, *-application: the banking of road curves*

Gravitation and satellites – Newton’s law of universal gravitation, satellites in circular orbits, *-application: weather and communication satellites*

Momentum in two dimensions – vector form of Newton’s second law of motion, Newton’s second law of motion in terms of momentum, law of conservation of momentum, *-application: rockets*

2. Electricity and magnetism

Electric fields – Coulomb’s law, principle of superposition, electric field, pictorial representation of electric fields, superposition of electric fields, electric field due to one or two charged plates, electric fields and conductors, electric

field inside a hollow conductor, electric fields near sharp points, *-application: photocopiers and laser printers*

The motion of charges particles in electric fields – electric potential difference, acceleration in a constant electric field, motion of a charged particle in a constant electric field, *-application: the use of electric fields in cyclotrons*

Magnetic fields – magnetic fields and their pictorial representation, magnetic force on a current-carrying conductor, *-application: the moving-coil loudspeaker*

The motion of charges particles in magnetic fields – force on a charged particle in a magnetic field, motion of a charged particle at right angles to a magnetic field, *-application: the use of magnetic fields in cyclotrons*

6. Assessment strategy

Assessment methods

Assessment should be progressive reflecting a holistic approach to ensure the module purpose is met and students are well prepared for work placement. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests. Written tests should include, multiple choice, short answer and problem type items.

Conditions of assessment

Learning and assessment will take place in an environment that is conducive to a learner’s development.

7. Learning outcome details

Learning outcome 1

Assessment criteria

- 1.1
- 1.2
- 1.3
- 1.4
- 1.5
- 1.6

Learning outcome 2

Assessment criteria

- 2.1

2.2

2.3

2.4

2.5

8. Delivery of the module

Delivery strategy

Delivery strategies must be suitable for both theoretical and practical learning and address the module purpose.

It is recommended that learning and assessment be facilitated in a holistic manner, which may require a learning outcome sequence other than that indicated in the body of the module.

Also an integrated theory/practice approach should be used where students learn by experimentation and through practical application.

Resource requirements

Resources should be sufficient for students to carry out exercises on an individual basis.

Trainers/teachers/facilitators must have qualifications in the relevant subject area they are engaged to deliver recognised trainer and assessment training and at least five years relevant work experience.

Useful references include:

Class notes

Physics reference books/manuals

Vocational problems and applications to be derived from real workplace experiences using industry sources and/or personnel

Occupational health and safety requirements

A safe and healthy environment will be provided for students and teachers as well as safety procedure with regard to learning/teaching activity.