

# MATH 1010 FUNDAMENTALS FOR ENGINEERING STUDIES (WSTC ASSOC D)

**Credit Points** 10

**Legacy Code** 700112

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**Description** This subject serves as an introduction to the key mathematics and physics concepts required to study engineering at a tertiary level. This subject has two major components, physics and mathematics. The physics component includes physical quantities, scalars and vectors, kinematics and dynamics. The mathematics component includes basic arithmetic and algebra, trigonometry, coordinate geometry, relations and functions and introduction to differentiation.

**School** Eng, Design & Built Env

**Discipline** Mathematics

**Student Contribution Band** HECS Band 1 10cp

Check your HECS Band contribution amount via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Undergraduate Level 1 subject

## Restrictions

Students must be enrolled in 7022 Associate Degree in Engineering

## Learning Outcomes

On successful completion of this subject, students should be able to:

1. Use graphical methods to analyse data using the scientific method;
2. Identify the characteristics of uniform motion and predict variables of motion based on past or current conditions;
3. Identify the characteristics of uniformly accelerated motion and predict variables of motion based on past or current conditions;
4. Use the concepts of kinematics to analyse two-dimensional projectile motion;
5. Use Newtonian dynamics to quantitatively analyse objects in equilibrium;
6. Use Newtonian dynamics to quantitatively analyse objects experiencing uniformly accelerated motion;
7. Use the concepts of work and conservation of energy to explain the behaviour of different systems;
8. Choose and apply appropriate arithmetic, algebraic and graphical techniques to solve problems;
9. Solve theoretical and real life problems using trigonometry;
10. Use algebra to solve geometrical problems in the Cartesian coordinate system;
11. Use the concept of a function and the relationship between dependent and independent variables to solve a variety of problems both algebraically and graphically;
12. Use introductory calculus concepts to solve problems involving rates of change;

13. Demonstrate an ability to solve problems by identifying interrelationships between ideas from different areas of mathematics;
14. Interpret and communicate mathematical ideas in a clear and effective manner, using logical arguments and appropriate notation.

## Subject Content

### 1. Physics

- a. Mechanics ? Physical Quantities - Units and their relationships
- b. Mechanics ? Scalars and Vectors - Addition and subtraction
- c. Mechanics ? Kinematics
  - Motion in a straight line
  - Motion in two dimensions
  - Graphing motion
  - Relative motion
- d. Mechanics ? Dynamics
  - Newton's Law of Motion
  - Momentum and Imp

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/Group Task
Quiz	30 minutes per week	30	N	Individual
Intra-session Exam	50 minutes	20	N	Individual
Practical	Intensive session day	10	N	Both (Individual & Group)
Final Exam	2 hours	40	N	Individual

### Prescribed Texts

- Grove, M., 2014, Maths in Focus: Mathematics Preliminary Course, Revised 2nd edition, 2014, Nelson Cengage Learning Australia, Melbourne.
- The College Physics Student Workbook
- The College Physics practical simulation workbook

### Teaching Periods

## Quarter 1 (2022)

### Nirimba Education Precinct

#### Composite

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View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=MATH1010\\_22-Q1\\_BL\\_C#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MATH1010_22-Q1_BL_C#subjects))

## Quarter 1 (2023)

### Nirimba Education Precinct

#### Hybrid

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