The College

900086
MATHEMATICS 2

2021

UNIT OUTLINE

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Last amended:	June 2021

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Unit name	Mathematics 2
Unit number	900086
Coordinator	Zdenka Misanovic
Session	2021.2
Handbook summary	This unit has been specifically designed for students who need to refresh or upgrade their understanding of basic mathematical concepts taught in high school mathematics. The topics include basic arithmetic and algebra, elementary functions, geometry, trigonometry and coordinate geometry.
Credit point value	10
Prerequisite/s	N/A
Corequisite/s	N/A
Unit incompatible with and not to be counted for credit with	N/A
Assumed knowledge	Mathematics Year 10 or equivalent
Unit level	Level Z — Non-award
Attendance requirements	Students are expected to attend at least 80% of classes. Educational research consistently demonstrates that this attendance level is associated with a high likelihood of achieving a passing grade.
Enrolment restrictions	Students must be enrolled at The College.
Learning outcomes	On successful completion of this unit, students should be able to: 1. select and apply a variety of algebraic techniques to solve equations and problems 2. solve geometric and trigonometric problems that involve two and three dimensional objects 3. use the concept of a function and the relationship between dependent and independent variables to solve a variety of problems both algebraically and graphically 4. use algebra to solve geometrical problems in Cartesian and polar coordinate systems 5. apply a variety of strategies to find mathematical models for problems involving exponential and logarithmic functions 6. demonstrate an ability to solve problems by identifying interrelationships between ideas from different areas of mathematics, and 7. interpret and communicate mathematical ideas in a clear and effective manner, using logical arguments and appropriate notation.

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Unit content

In this unit, students will learn about:

- basic arithmetic operations (with whole numbers, fractions and decimals, index numbers, units and measurements)
- basic algebra (terminology, simplifying algebraic expressions, expanding and factorising, working with algebraic fractions, solving linear and quadratic equations, substituting into formulas and changing the subject, simultaneous equations)
- functions (terminology and notation, domain and range, graphs of functions, composite functions, inverse functions), elementary functions (linear, quadratic, exponential and logarithmic).
- geometry (angles, triangles, rectangles, circles, Pythagoras' Theorem, areas and volumes)
- trigonometry (basic trigonometric ratios, exact ratios, complementary angles, angles of any magnitude, sine and cosine rule, trigonometric functions and their graphs), and
- coordinate geometry (Cartesian coordinate system, distance between two points, equation of a straight line, gradient of a line, distance of a point from a line, loci, equation of a circle, polar coordinates, Pythagoras' Theorem in 3D).

Mode of delivery

This unit is taught on a face-to-face basis and includes six hours of classes per week. In addition, students will be required to access vUWS regularly to download additional learning material, and to check for any announcements about the unit that may be posted there.

Online learning requirements

Essential requirements

Recommended texts

Breach, M 2011, *Fundamental maths: for engineering and science*, Palgrave Macmillan, Basingstoke.

The College, *Mathematics 2 question booklet*, Western Sydney University The College, Sydney.

Further resources

Croft, A 2015, *Mathematics for engineers: a modern interactive approach*, 4th edn, Pearson-Prentice Hall, Harlow.

Croft, A 2016, *Foundation maths*, 6th edn, Pearson-Prentice Hall, New York.

Fitzpatrick, JB 2013, *New senior mathematics for Years 11 and 12*, 2nd edn, Pearson Australia, Melbourne.

James, G 2015, *Modern engineering mathematics*, 5th edn, Pearson-Prentice Hall, Harlow.

Washington, AJ 2018, *Basic technical mathematics with calculus*, 11th edn, Pearson-Prentice Hall, Upper Saddle River, NJ.

Essential equipment

- A College-approved, non-programmable scientific calculator

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ASSESSMENT ITEMS AND WEIGHTING

Assessment for this unit will be based on the following components:

Task	Weighting	Learning outcomes assessed	Mandatory task
1. Numerical problem-solving task 1 (1 hour) (Class test 1)	10%	1, 6 and 7	Yes
2. Numerical problem-solving task 2 (1 hour) (Class test 2)	25%	1, 2, 3, 6, 7	Yes
3. Numerical problem-solving task 3 (1 hour) (Class test 3)	25%	1, 4, 5, 6, 7	Yes
4. End of Session exam (2 hours)	40%	1–7	Yes
Total	100%		

For details of assessment due dates, please refer to the learning guide for this unit.

All marks will be determined in accordance with The College Assessment Policy.

All assessment tasks are mandatory unless otherwise specified. Should a student fail to attempt/submit the first formal assessment task in a unit, they will be deemed to be at risk and will need to follow an intervention plan in order not to receive a Fail Non-Submission (FNS) grade. However, failure to attempt/submit all other mandatory assessment tasks will result in an immediate FNS grade for the unit.

To pass this unit, students must:

- attempt/submit all assessment tasks (including the End of Session exam), and
- achieve an overall mark of at least 50%.

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