Course Outline

Title: ESSENTIAL MATHEMATICS

Code: MTHGC1010

Faculty / Portfolio: Faculty of Science and Technology

Program Level:

	AQF Level of Program					
	5	**6**	**7**	**8**	**9**	**10**
Level						
Introductory			✔			
Intermediate						
Advanced						

Pre-requisites: Nil

Co-requisites: Nil

Exclusions: Nil

Credit Points: 15

ASCED Code: 010101

Learning Outcomes:

Knowledge:

- **K1.** Recognise basic mathematical functions.
- **K2.** Identify how they arise in physical situations.
- **K3.** Distinguish 2D and 3D geometrical properties relevant to the science disciplines.
- **K4.** Recognise the uses and relevance of elementary descriptive statistics in the science disciplines.
- **K5.** Explain rates of change and area as applied to graphs.

Skills:

- **S1.** Demonstrate competency with basic calculation skills required for science.
- **S2.** Confidently convert between scientific units.
- **S3.** Manipulate algebraic expressions accurately.
- **S4.** Use functions involving powers, logarithms and exponents.
- **S5.** Present data graphically and use numerical summaries.
- **S6.** Think critically when analysing problems.
- **S7.** Model physical situations mathematically.

Application of knowledge and skills:

- **A1.** Use mathematical techniques to model the physical world.
- **A2.** Adapt to new circumstances.
- **A3.** Master new techniques.
- **A4.** Recognise the common principles in a variety of scientific applications.

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Values and Graduate Attributes:

Values:

V1. Appreciation of mathematics as a universal language and its value as a problem solving tool.

V2. Demonstrably linking mathematical knowledge and skills to the science curriculum.

Graduate Attributes:

Attribute	Brief Description	Focus
Continuous Learning	Scaffolded learning of mathematical skills which build continuously on earlier material. Skills developed in this course are core for further learning.	High
Self Reliance	Self assessment and reflection of learning by students is embedded into the course assessment.	Medium
Engaged Citizenship	Contextualising of mathematical skills within the broader framework of scientific thinking, application and research enables critical thinking and creative problem solving.	Low
Social Responsibility	Appreciation of mathematics as a universal language and its value as a problem solving tool are essential skills for developing a sense of social responsibility.	Low

Content:

Topics may include:

- Arithmetic: Operations, number rules, percentages and scientific notation, fractions, ratios, unit conversions, indices.
- Algebra: Constants and variables, word problems and equations, solving linear and quadratic equations and simultaneous linear equations.
- Geometry: Shapes in 2 and 3 dimension, length, area, volume, Pythagoras'€™ theorem and coordinate geometry.
- Functions: Simple algebraic functions: Polynomial and rational. Other useful functions: Logarithmic and exponential.
- Basic descriptive statistics: Presenting categorical and measurement data, frequency distributions, location and spread and the use and abuse of statistics.
- Mathematical literacy: using a mathematical argument and appropriate equations, graphs and data to support a claim
within a report as well as presentation of mathematical material using digital media.

Assessment:

Learning Outcomes Assessed	Assessment Task	Assessment Type	Weighting
A1-A4	Demonstrated engagement with weekly tutorial and case based group work activities.	Participation.	2.5-5%
K1-K5, S1-S7	Students complete a portfolio of tutorial questions.	Portfolio.	30-40%

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K1-K5, S1-S7, A2-A3	Students complete a series of review questions in class time. Students also complete a self-assessment of their skills around the examined topics allowing them to target their future revision.	Review task.	15-20%
K1-K4, S1-S7, A2-A4	Two hour examination covering all course content, scientific calculator and single A4 2 sided sheet of notes allowed.	Exam.	40-50%

Adopted Reference Style:

Australian

Presentation of Academic Work:

FedUni General Guide to Referencing