



Course Outline (Higher Education)

School:	School of Engineering, Information Technology and Physical Sciences
Course Title:	INTRODUCTION TO MATHEMATICS: PRINCIPLES AND TECHNIQUES
Course ID:	MATHS1101
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	MATHS1000
ASCED:	010101

Description of the Course :

This course allows students to build conceptual understanding and see the relevance of mathematics in a scientific and technical context. Various concepts and techniques in elementary mathematics that will equip students for further mathematical and technical courses will be introduced/reviewed. The course would be particularly valuable to students interested in improving their understanding of basic mathematical principles and techniques and to prospective teachers of mathematics at primary and secondary level.

Grade Scheme: Graded (HD, D, C, etc.)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:**Knowledge:**

- K1.** Understand how basic mathematical techniques can be used to solve problems in various scientific and technical contexts.
- K2.** Identify, describe and explain the nature and properties of various mathematical functions and graphs
- K3.** Understand basic concepts of probability and set theory

Skills:

- S1.** Manipulate and rearrange algebraic expressions
- S2.** Solve simultaneous equations
- S3.** Analyse functions using their graphs
- S4.** Perform basic operations on matrices and vectors
- S5.** Apply basic geometry and trigonometry to solve practical problems
- S6.** Use mathematical software to solve various mathematical problems

Application of knowledge and skills:

- A1.** Model and analyse physical phenomena using mathematical constructs

Course Content:

Topics may include:

- Elementary algebra
- Elementary functions and their graphs
- Elementary geometry
- Trigonometry
- Basic notions of linear algebra
- Basic probability
- Basic set theory
- Basic mathematical logic

Values:

- V1.** Appreciate the role of mathematics in modelling real-world problems

Graduate Attributes

The Federation University FedUni graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course			
		Learning Outcomes (KSA)	Code A. Direct B. Indirect N/A Not addressed	Assessment task (AT#)	Code A. Certain B. Likely C. Possible N/A Not likely
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1-K3; S1-S6; A1	A, A, A	1, 2, 3	B, B, B
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	Not applicable	Not applicable	Not applicable	Not applicable
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	Not applicable	Not applicable	Not applicable	Not applicable
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K1-K3; S1-S6; A1	B, B	1, 2	B, B
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	Not applicable	Not applicable	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1-K2; S1-S6, A1	Participate in class activities; use mathematical software	Portfolio of completed work	10-30%
K1-K3; S1-S6; A1	Self-directed or group exploration; problem solving	Assignment/Project/Presentation	10-30%
K1-K3; S1-S5	Review and skills practice	Test/Examination	40-60%

Adopted Reference Style:

APA