Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: Applied Mathematics 1

Unit ID: MATHS1100

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): (MATHS1001)

ASCED: 010101

Description of the Unit:
This unit is aimed at a broad tertiary level audience interested in solving real world problems. The main focus will be on learning and applying standard calculus techniques to model motion, growth and change. Problems requiring optimisation techniques and calculation of area, and involving differential equations will also be considered. It will be particularly valuable to prospective secondary school mathematics teachers, engineers and any student interested in improving their understanding of these commonly encountered areas of applied mathematics.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

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 Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory			✔			

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Intermediate						
Advanced						

Learning Outcomes:

Knowledge:

K1. Describe the mathematical properties of functions.
K2. Demonstrate understanding of fundamental calculus techniques.
K3. Recognise the concept of a limit and its significance in calculus.

Skills:

S1. Illustrate and analyse important features of functions.
S2. Calculate derivatives and integrals of functions.
S3. Classify and identify different types of differential equations.
S4. Determine the area between curves and the volume of a solid using integration.
S5. Utilise appropriate technology to assist in the solution and investigation of problems.

Application of knowledge and skills:

A1. Solve applied problems using differentiation and integration techniques.
A2. Apply various methods of solutions for solving ordinary differential equations.
A3. Interpret the solutions to calculus problems understanding their implications in real world context.

Unit Content:

Topics in this unit may include an introduction to the concepts of mathematical modelling and functions, differential and integral calculus with applications, including differential equations.

Topics may include:

- Functions and their graphs
- Limits and continuity
- Derivatives and applications
- Integrals and applications
- Differential equations

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K3; S1-S5; A1-A3	A range of tasks and problems explored individually or in groups to support the understanding of the content and the development of skills and knowledge throughout the unit.	Assignments/Projects/Presentation	35% - 55%
S1-S5, A2	Weekly or fortnightly quizzes to support the understanding of the content and the development of skills and knowledge throughout the unit.	Quizzes	5% - 25%

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K3, S1-S4, A1-A2	A test on any part of or all the material covered in the unit.	Test	30% - 50%

Adopted Reference Style:

IEEE

Refer to the library website for more information

Fed Cite - referencing tool