Course Outline (Higher Education)

Institute: Institute of Innovation, Science & Sustainability

Course Title: MODELLING AND CHANGE (INTRODUCTORY LEVEL)

Course ID: MATHS1001

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): (MA551)

ASCED: 010101

Description of the Course:
This course 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 will also be considered. It will be particularly valuable to prospective secondary school mathematics teachers 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 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			✔			
Intermediate						
Advanced						

Learning Outcomes:

Knowledge:

K1. Describe the mathematical properties of functions
K2. Explain fundamental calculus techniques
K3. Describe how fundamental calculus techniques are related

Skills:

S1. Illustrate important features of functions using graphs
S2. Calculate the limit and derivative of functions
S3. Determine the general antiderivative of functions
S4. Evaluate definite and indefinite integrals
S5. Determine the area between curves and the volume of a solid using integration
S6. Utilise appropriate technology to assist in the solution and investigation of problems

Application of knowledge and skills:

A1. Apply differentiation and integration techniques to solve physical applications
A2. Interpret the results produced by a model to help solve real world problems

Course Content:

Topics in this course may include an introduction to the concepts of mathematical modelling and functions, calculus, trigonometry and optimisation through the use of real world problems.

Values:

V1. Appreciate the role of mathematics for finding solutions to real world problems

Graduate Attributes

The Federation University Federation 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)	**Assessment task (AT#)**
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-A2	1, 2

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
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
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
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-A2	1
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

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1-K3; S1-S6; A1-A2	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 course.	Projects/presentation/assignments/quizzes	40 - 50%
K1-K2, S1-S5, A1	A test and/or examination on any part of or all the material covered in the course.	Test(s)/Examination(s)	50 - 60%

Adopted Reference Style:

APA

Refer to the library website for more information

Fed Cite - referencing tool