Course Title:	**Modelling and Differential Equations I**
Course Code:	**MATH606**
Descriptor Start Date:	**01/01/2026**
POINTS:	**15.00**
LEVEL:	**6**
PREREQUISITE/S:	**MATH505**
COREQUISITE/S:	**None**
RESTRICTION/S:	**None**

LEARNING HOURS

Hours may include lectures, tutorials, online forums, laboratories. Refer to your timetable and course information in Canvas for detailed information.

Total learning hours: 150

PRESCRIPTOR

Develops techniques in ordinary differential equations, and gives an introduction to partial differential equations, with a focus on modelling a variety of phenomena in the areas of science, engineering, and business. Includes the use of appropriate mathematical software to analyse mathematical models involving differential equations.

LEARNING OUTCOMES

1. Classify and apply appropriate solution techniques for a range of ordinary and partial differential equations.
2. Describe the differences and applicability of different types of differential equation solutions (analytic, numerical, qualitative).
3. Create models of systems using ordinary and partial differential equations.
4. Explain the usefulness of differential equations in mathematical modelling.
5. Use appropriate mathematical software to solve differential equations.

CONTENT

Content may include but need not be limited to:

- Modelling of practical systems, leading to linear differential equations of first order, second order and higher order, both homogeneous and non-homogeneous.
- Techniques of solution (analytic, numerical, and qualitative) to differential equations, including:
  First-order differential equations
  Higher-order differential equations
  First-order systems
  Linear systems
  Heat equation, wave equation, and Laplace equation

LEARNING & TEACHING STRATEGIES

A range of teaching and learning strategies may include lectures, computer labs, tutorials, and online learning.

ASSESSMENT PLAN

Assessment Event	Weighting %	Learning Outcomes
Assignment 1	30.00	1-5
Assignment 2	30.00	1-5
Portfolio	40.00	1-5

Grade Map **MAP1**

A+ A A- Pass with Distinction
B+ B B- Pass with Merit
C+ C C- Pass
D Fail

Overall requirement/s to pass the course:

To pass this course, students must achieve a minimum overall grade of C-.

LEARNING RESOURCES

Readings will be recommended by the lecturer.

For further information, contact: Te Ara Auaha - Faculty of Design & Creative Technologies

Principal Programme: **DJ1041, Bachelor of Science**

Related Programme/s: **AK3750**
DJ1042
DJ1043
HA1041
HA1042
HA1043
ICE1
INEXCH1
SABRD1

Disclaimer: Course descriptors may be amended between teaching periods/semesters