

MTH302 Applied Mathematics

School: School of Science, Technology and Engineering

2026 | Trimester 2

UniSC Sunshine Coast
UniSC Moreton Bay

**BLENDED
LEARNING**

Most of your course is on campus but you may be able to do some components of this course online.

Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1. Description

In this course you will be introduced to differential equations and other mathematical methods which can be used to explore and model situations in the physical, biological and engineering sciences. The course includes derivation, application, solution techniques, and evaluation of mathematical models using first order, second order, and nth order ordinary and partial differential equations that you will be able to apply in a range of contexts.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – You are required to engage and interact with asynchronous materials and activities accessed through Canvas modules, course readings and textbook activities.	1hr	Week 1	12 times
Tutorial/Workshop 1 – A blended learning approach is used to deliver the tutorial/workshop component of this course. The tutorial/workshop is synchronous with on-campus engagement and application of learning materials.	2hrs	Week 1	12 times

1.3. Course Topics

Classification and solution methods for, and applications of first order differential equations

Classification and solution methods for, and applications of second order differential equations

An introduction to applications and solutions of partial differential

The Laplace Transform and its uses

Interpreting differential equations in the literature

2. What level is this course?

300 Level (Graduate)

Demonstrating coherence and breadth or depth of knowledge and skills. Independent application of knowledge and skills in unfamiliar contexts. Meeting professional requirements and AQF descriptors for the degree. May require pre-requisites where discipline specific introductory or developing knowledge or skills is necessary. Normally undertaken in the third or fourth full-time study year of an undergraduate program.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES	GRADUATE QUALITIES
On successful completion of this course, you should be able to...	Completing these tasks successfully will contribute to you becoming...
1 Recall, explain and apply the theory, tools and techniques of topics related to differential equations.	Knowledgeable Empowered
2 Select and combine mathematical tools and techniques to solve mathematical problems in mathematics and science.	Creative and critical thinker Empowered
3 Communicate concepts and techniques relevant to the use of applied mathematics, using both written English and mathematical notations, as appropriate.	Knowledgeable Empowered
4 Interpret mathematics in the literature.	Creative and critical thinker Empowered

5. Am I eligible to enrol in this course?

Refer to the [UniSC Glossary of terms](#) for definitions of "pre-requisites, co-requisites and anti-requisites".

5.1. Pre-requisites

MTH202 or MTH104

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

MTH522

5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

5.5. Microcredential Information

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

6.2. Details of early feedback on progress

Early feedback on progress will be provided in tutorial time in the first 3 weeks.

6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1a	Oral	Individual	20%	10 minutes	Week 4	In Class
All	1b	Written Piece	Individual	20%	10 x set problems	Week 8	Online Submission
All	2	Written Piece	Group	20%	1000 words	Week 11	Online Assignment Submission with plagiarism check
All	3	Examination - Centrally Scheduled	Individual	40%	2 hours	Exam Period	Exam Venue

All - Assessment Task 1a: Assignment

GOAL:	Students successfully completing this task will have demonstrated an understanding of the modelling process with differential equations and applied this knowledge to a real world problem.													
PRODUCT:	Oral													
AUTHORSHIP STATEMENT:														
FORMAT:	Students will negotiate a problem to present to the tutorial group with the tutor. Each student will have 10 minutes to present their solution to the class.													
CRITERIA:	<table border="1"> <thead> <tr> <th>No.</th> <th></th> <th>Learning Outcome assessed</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Correctness of calculations</td> <td>1</td> </tr> <tr> <td>2</td> <td>Clarity of mathematical reasoning</td> <td>2</td> </tr> <tr> <td>3</td> <td>Mathematical communication skills both oral and written</td> <td>3</td> </tr> </tbody> </table>	No.		Learning Outcome assessed	1	Correctness of calculations	1	2	Clarity of mathematical reasoning	2	3	Mathematical communication skills both oral and written	3	
No.		Learning Outcome assessed												
1	Correctness of calculations	1												
2	Clarity of mathematical reasoning	2												
3	Mathematical communication skills both oral and written	3												
GENERIC SKILLS:	Communication, Problem solving, Applying technologies													

All - Assessment Task 1b: Assignment Worked examples

GOAL:	Students successfully completing this task will have demonstrated an understanding of the modelling process with differential equations and applied this knowledge to real-world problems.	
PRODUCT:	Written Piece	
AUTHORSHIP STATEMENT:		
FORMAT:	Solutions to selected skill and application-based problems. Questions will be given in week 5. To be submitted during the scheduled tutorial class and/or uploaded to Canvas.	
CRITERIA:	No.	Learning Outcome assessed
	1 application and explanation of appropriate theory, tools, and techniques to solve selected first order ordinary differential equations	1
	2 solution of selected mathematical problems	2
	3 communication of the methods, reasoning and working of the solutions	3
GENERIC SKILLS:	Communication, Problem solving	

All - Assessment Task 2: Written report

GOAL:	Students successfully completing this task will write an interpretation of an article including differential equations as a solution to a real-world problem	
PRODUCT:	Written Piece	
AUTHORSHIP STATEMENT:		
FORMAT:	A written report submitted to Canvas. In groups of 2 or 3 students you will choose an article from Nature from those provided on Canvas and write an article for an undergraduate magazine that explains the mathematics used.	
CRITERIA:	No.	Learning Outcome assessed
	1 Knowledge and understanding of the mathematics in the article	1
	2 Interpretation of the chosen article in response to the stimulus question given via Canvas	4
	3 Written communication and mathematical and academic literacies including English expression, grammar, spelling, punctuation, and referencing conventions	3
GENERIC SKILLS:	Communication, Collaboration, Information literacy	

All - Assessment Task 3: End of trimester exam

GOAL:	The end of trimester examination gives you an opportunity to demonstrate your knowledge, understanding and skills associated with the learning outcomes of the course.		
PRODUCT:	Examination - Centrally Scheduled		
AUTHORSHIP STATEMENT:			
FORMAT:	Individual Solutions to selected skill and application based problems.		
CRITERIA:	No.		Learning Outcome assessed
	1	application of appropriate methods to solve selected first, second and particular higher order ordinary and partial differential equations	1
	2	derivation of solutions for particular applications	2
	3	correct mathematical communication of the methods, reasoning and working by which solutions were calculated	3
GENERIC SKILLS:			

7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

You need regular access to the resource(s) below. Many texts are available as ebooks through the [Library](#) at no additional cost.

REQUIRED?	AUTHOR	YEAR	TITLE	EDITION	PUBLISHER
Required	Bronson, R. and Costa, G.B	2014	Schaum's Outline of Differential Equations	4th	McGraw-Hill Education

8.2. Specific requirements

Not applicable

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the [online induction training for students](#), and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:

- (a) The final mark is in the percentage range 47% to 49.4%; and
- (b) The course is graded using the Standard Grading scale

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying: The final mark is in the percentage range 47% to 49.4% The course is graded using the Standard Grading scale You have not failed an assessment task in the course due to academic misconduct

10.3. Assessment: Submission penalties

Late submissions may be penalised up to and including the following maximum percentage of the assessment task's identified value, with weekdays and weekends included in the calculation of days late:

- (a) One day: deduct 5%;
- (b) Two days: deduct 10%;
- (c) Three days: deduct 20%;
- (d) Four days: deduct 40%;
- (e) Five days: deduct 60%;
- (f) Six days: deduct 80%;
- (g) Seven days: A result of zero is awarded for the assessment task.

The following penalties will apply for a late submission for an online examination:

- Less than 15 minutes: No penalty
- From 15 minutes to 30 minutes: 20% penalty
- More than 30 minutes: 100% penalty

10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit <https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching>

10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The [Student Charter](#) sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

10.6. General Enquiries

For course-specific questions, contact your teaching staff or Course Coordinator.

For other enquiries or to access support, please contact Student Central:

- [UniSC Student Central](#)
- [UniSC Adelaide Student Central](#)

