COURSE OUTLINE

TPP115 Maths for Science and Engineering

School: School of Education and Tertiary Access

2023 | Semester 1

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 usc.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

This course develops a foundation for further studies in mathematics. It comprises most concepts from the Queensland Year 12 Mathematical Methods curriculum, excluding statistics, thus satisfying the math entry requirement for Engineering at USC. To succeed at this course you will need to have a reasonable knowledge of math at least to TPP104 level, and be determined to succeed. A TPP115 readiness quiz to assist in judging your assumed knowledge is available on the My Open Math website (course ID 66583, enrollment key TPP104.115).

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – A range of weekly materials delivered through Canvas and MyOpenMath including course recordings, reading materials and activities	3hrs	Week 1	13 times
Tutorial/Workshop 1 – On campus engagement and application of the learning materials	2hrs	Week 1	13 times
Independent Study/Research – In addition to engaging with the learning materials, tutorials and assessment materials, you are expected to engage in self-directed study and revision of the course content, using the Canvas and MyOpenMath course materials	7hrs	Week 1	13 times

1.3. Course Topics

Revision of NUMBER and ALGEBRA: signed numbers, order of operations, factors, primes and factorisation, fractions, indices, number precision, algebra, transposing equations, the rectangular coordinate system.

FUNCTIONS and RELATIONS equations and graphs: linear, quadratic, trigonometric, exponential and logarithmic functions, composite and inverse functions, transformation of functions, circle equations and graphs.

CALCULUS: introduction to differentiation, product, quotient and chain rules.

2. What level is this course?

100 Level (Introductory)

Engaging with discipline knowledge and skills at foundational level, broad application of knowledge and skills in familiar contexts and with support. Limited or no prerequisites. Normally, associated with the first 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 On successful completion of this course, you should be able to...		GRADUATE QUALITIES Completing these tasks successfully will contribute to you becoming...
1	Demonstrate knowledge of the mathematical concepts of a function and its inverse (including periodic, exponential, and logarithmic functions), differentiation and integration.	Empowered
2	Demonstrate mathematical skills in solving familiar problems in the areas of functions and calculus.	Knowledgeable
3	Demonstrate mathematical knowledge of concepts, techniques and reasoning to interpret, analyse and solve unfamiliar and applied problems.	Empowered
4	Communicate effectively using reasoning, mathematical symbols and conventions.	Empowered
5	Employ technology appropriately to help solve problems.	Engaged

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

Students must be enrolled in TP000

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

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

Students should have effective numeracy, algebraic and calculator skills. Students who have not completed Year 10 maths or equivalent should complete TPP104 prior to undertaking TPP115

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

Beginning in week zero (O week), there are formative quizzes on My Open Math. They provide an opportunity to check knowledge and skills.
Early personalised feedback is provided when the week 3 Investigation is marked.

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	1	Artefact - Technical and Scientific	Individual	30%	2-3 hours each	Throughout teaching period (refer to Format)	Online Submission
All	2	Examination - not Centrally Scheduled	Individual	25%	2.5 hours	Week 9	Online Test (Quiz)
All	3	Examination - Centrally Scheduled	Individual	45%	2.5 hours	Exam Period	Online Test (Quiz)

All - Assessment Task 1: Mathematical Investigations

GOAL:	The mathematical investigations explore and supplement the content required for the course. The goal is to practice course skills, recognise patterns, apply them, generalise them into an equation and articulate them in writing, while developing the collaborative skill of working in groups.
PRODUCT:	Artefact - Technical and Scientific
FORMAT:	Submit: End of Week 3, 6, 12. Working in a small groups, you investigate mathematical concepts using computer technology. You will assemble a portfolio of 3 investigations.
CRITERIA:	

No.		Learning Outcome assessed
1	Knowledge of the mathematical concepts of algebra, transformation of functions and circles, and exponential and logarithmic functions.	1
2	Demonstration of mathematical knowledge of concepts and techniques to interpret, analyse and solve calculus problems.	3
3	Effective communication using reasoning, mathematical symbols and conventions.	4
4	Demonstration of mathematical skills to solve algebraic, exponential and logarithmic problems.	2
5	Appropriate employment of technology to solve problems.	5

GENERIC SKILLS:	Communication, Collaboration, Problem solving, Applying technologies, Information literacy

All - Assessment Task 2: Mid Semester Exam

GOAL:	This task allows you to demonstrate your conceptual and procedural knowledge of the content of the first three modules of the course: number and algebra revision, functions and relations, and trigonometry.
PRODUCT:	Examination - not Centrally Scheduled
FORMAT:	There will be an online examination in week 9. Formative quizzes at the end of weekly lessons, and at the end of module 1-3 provide practice for the week 9 mid-semester exam.

CRITERIA:

No.		Learning Outcome assessed
1	Mathematical conceptual knowledge of linear, quadratic, composite, inverse, piecewise, and periodic functions.	1
2	Employment of appropriate technology to solve problems.	5
3	Mathematical knowledge of concepts, techniques and reasoning to interpret, analyse and solve problems developed from module 1-3 learning.	3
4	Effective communication using reasoning, mathematical symbols and conventions.	4
5	Demonstration of mathematical skills to solve familiar problems in the area of functions.	2

GENERIC SKILLS:	Problem solving, Applying technologies, Information literacy

All - Assessment Task 3: Final Exam

GOAL:	This task allows you to demonstrate your cumulative understanding and knowledge of mathematical concepts and skills in solving routine problems on topics spanning the entire semester. Both Task 1 and Task 2 will assist you to consolidate your learning and prepare for this task.
PRODUCT:	Examination - Centrally Scheduled
FORMAT:	An online examination consisting of multiple-choice and short-answer questions. The examination is managed by UniSC examinations. It must be completed during the centrally scheduled exam period in week 15-16.

CRITERIA:

No.		Learning Outcome assessed
1	Knowledge of functions and its inverse (including periodic, exponential, logarithmic functions), and differentiation.	1
2	Mathematical skills to solve standard and applied problems.	2
3	Knowledge of mathematical concepts, techniques and reasoning to interpret, analyse and solve unfamiliar and applied problems.	3
4	Effective communication using reasoning, mathematical symbol and conventions.	4
5	Effective employment of technology to solve problems.	5

GENERIC SKILLS:	Communication, Problem solving, Applying technologies, Information literacy

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

> There are no required/recommended resources for this course.

8.2. Specific requirements

Materials used in this course are available online. A reliable computer and internet connection is essential. Facilities are available on campus. A scientific calculator is sufficient. The Casio fx-82AU Plus II 2nd edition (scientific) is recommended and will be used for demonstrations. Free graphing calculators are available online. It is your responsibility to learn to use your calculator properly.

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:

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 submission of assessment tasks may be penalised at the following maximum rate:
- 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task.
- 10% (of the assessment task's identified value) for the third day - 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task.
- A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task. Weekdays and weekends are included in the calculation of days late. To request an extension you must contact your course coordinator to negotiate an outcome.

10.4. SafeUniSC

UniSC is committed to a culture of respect and providing a safe and supportive environment for all members of our community. For immediate assistance on campus contact SafeUniSC by phone: 07 5430 1168 or using the SafeZone app. For general enquires contact the SafeUniSC team by phone 07 5456 3864 or email safe@usc.edu.au.

The SafeUniSC Specialist Service is a Student Wellbeing service that provides free and confidential support to students who may have experienced or observed behaviour that could cause fear, offence or trauma. To contact the service call 07 5430 1226 or email studentwellbeing@usc.edu.au.

10.5. Study help

For help with course-specific advice, for example what information to include in your assessment, you should first contact your tutor, then your course coordinator, if needed.

If you require additional assistance, the Learning Advisers are trained professionals who are ready to help you develop a wide range of academic skills. Visit the Learning Advisers web page for more information, or contact Student Central for further assistance: +61 7 5430 2890 or studentcentral@usc.edu.au.

10.6. Wellbeing Services

Student Wellbeing provide free and confidential counselling on a wide range of personal, academic, social and psychological matters, to foster positive mental health and wellbeing for your academic success.

To book a confidential appointment go to Student Hub, email studentwellbeing@usc.edu.au or call 07 5430 1226.

10.7. AccessAbility Services

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, learning disorder mental health issue, injury or illness, or you are a primary carer for someone with a disability or who is considered frail and aged, AccessAbility Services can provide access to appropriate reasonable adjustments and practical advice about the support and facilities available to you throughout the University.

To book a confidential appointment go to Student Hub, email AccessAbility@usc.edu.au or call 07 5430 2890.

10.8. 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

10.9. 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.

10.10. General Enquiries

In person:

- **UniSC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **UniSC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **UniSC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **UniSC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **UniSC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **UniSC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

Tel: +61 7 5430 2890

Email: studentcentral@usc.edu.au