COURSE OUTLINE

TPP115 Maths for Science and Engineering

Course Coordinator: Erin Siostrom (esiostrom@usc.edu.au) **School:** School of Education and Tertiary Access

2021 | Semester 2

USC Sunshine Coast
USC Moreton Bay

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

Please go to the USC website 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 of the math content of 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
ON CAMPUS			
Tutorial/Workshop 1	2hrs	Week 1	13 times
Lecture	2hrs	Week 1	13 times

1.3. Course Topics

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

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, graph sketching and optimisation, integration.

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 USC 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

Tasks 1 and 2 are conducted in MyOpenMath, a maths website, which provides instant feedback on your responses to questions. Additionally, feedback is given on students' mathematical communication skills through manual feedback on some questions in MyOpenMath.

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 Assignment Submission
All	2	Quiz/zes	Individual	25%	2.5 hours	Week 9	Online Test (Quiz)
All	3	Examination - Centrally Scheduled	Individual	45%	2.5 hours	Exam Period	Exam Venue

All - Assessment Task 1: Mathematical Investigations

GOAL:	The mathematical investigations explore content required for the course, to supplement the content explicitly taught. They provide an opportunity to think more deeply about mathematical concepts such as geometry and graphing. In most activities, the aim is to recognise patterns, apply them and generalise them into an equation and articulate them in writing. A secondary aim is to develop collaboration skills in working in groups.
PRODUCT:	Artefact - Technical and Scientific
FORMAT:	Submit: Friday of Week 3, 6,12 at 5pm. Working in a small group, you investigate mathematical concepts using computer technology. You will assemble a portfolio of 3 investigations.

CRITERIA:

No.		Learning Outcome assessed
1	Perform routine calculations and procedures.	1 2 3 4 5
2	Identify patterns and make links between algebraic and graphical forms.	3
3	Apply patterns to different functions or situations.	3 4 5
4	Generalise patterns	1 3 4
5	Communicate ideas clearly, using reasoning, appropriate mathematical terminology, symbols and conventions, as well as diagrams (where appropriate).	4
6	Instructions will be available under the Assessment tab on Blackboard	1 2 3 4 5

All - Assessment Task 2: Mid Semester Quiz

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:	Quiz/zes
FORMAT:	There will be an online quiz in week 9. Formative quizzes at the end of module 1-3 provide practice for the week 9 quiz.

CRITERIA:

No.		Learning Outcome assessed
1	Display understanding of the key concepts of the course.	1 2 3 4 5
2	Employ appropriate skills, procedures and reasoning to solve standard and applied problems.	2 4 5
3	Accurately find a solution to a problem.	3
4	Present the solution in an appropriate format.	4 5

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:	A written exam consisting of multiple-choice and short-answer questions, which are to be handwritten in an examination booklet or submitted via an online quiz. The exam will be held during the centrally scheduled exam period, which is held in week 15-16 and managed by the examinations team.

CRITERIA:	No.		Learning Outcome assessed
	1	Display understanding of the key concepts of the course.	1 2 3 4 5
	2	Employ appropriate skills and procedures to solve standard and applied problems.	2 3
	3	Use reasoning to find a solution to a problem.	1 4
	4	Accurately find a solution to a problem.	3
	5	Present the solution in an appropriate format.	4 5
	6	Communicate ideas clearly, using reasoning, appropriate mathematical terminology, symbols and conventions, as well as diagrams (where appropriate)	

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. Directed study hours may vary by location. 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 Blackboard 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

As the materials used in this course are available only 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 (scientific) is recommended and will be used for demonstrations. Free graphing calculators are available online, but cannot be used during the final exam. It is your responsibility to learn to use your calculator properly. 2 mm graph paper is required.

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 Blackboard, are electronically checked through SafeAssign. This software allows for text comparisons to be made between your submitted assessment item and all other work that SafeAssign has access to.

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. 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.

10.5. 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.

10.6. 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.

10.7. 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
- Administration of Central Examinations
- Deferred Examinations
- Student Academic Misconduct
- Students with a Disability

Visit the USC website: http://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.8. General Enquiries

In person:

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

Tel: +61 7 5430 2890
Email: studentcentral@usc.edu.au