

## Course Outline

**Code: EDU364**

### **Title: Teaching Senior Secondary Mathematics**

<b>School of:</b>	Education
<b>Teaching Session:</b>	Semester 2
<b>Year:</b>	2019
<b>Course Coordinator:</b>	Dr Margaret Marshman Email: mmarshma@usc.edu.au
<b>Course Moderator:</b>	Associate Professor Deborah Heck Email: dheck@usc.edu.au

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 will develop your knowledge of transformative curriculum practices for Senior Phase learners, within the Senior Secondary Queensland Curriculum for Mathematics. You will develop your skills in designing engaging curriculum that will significantly affect the learning outcomes of the diverse range of senior students and support you to creatively apply relevant pedagogical content knowledge.

##### **1.2 Course topics**

- Senior Curriculum documents in Mathematics
- Curriculum planning and alignment of content, pedagogy and assessment
- Teaching and learning strategies for engagement in Mathematics
- Assessment and reporting practices in the senior phase
- Mathematical modelling and problem solving
- Integrating resources, including information and communication technologies (ICT) into mathematics curriculum
- Literacy and numeracy in senior mathematics
- Embedding Aboriginal and Torres Strait Islander histories, culture and knowledges in the senior mathematics curriculum

#### **2. What level is this course?**

300 level Graduate - Independent application of graduate knowledge and skills. Meets AQF and professional requirements. May require pre-requisites and developing level knowledge/skills. Normally taken in the 3rd or 4th 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?

<b>Specific Learning Outcomes</b> On successful completion of this course you should be able to:	<b>Assessment Tasks</b> You will be assessed on the learning outcome in task/s:	<b>Graduate Qualities or Professional Standards mapping</b> Completing these tasks successfully will contribute to you becoming:
Apply your knowledge of mathematics content and curriculum to develop activities for mathematical modelling and problem solving teaching sequences and assessment strategies to engage all learners.	1. Preparing Assessment in Mathematics 2. Retrospective Learning Sequence 3. Examination	Creative and critical thinkers. Engaged.
Apply a student centred approach to curriculum planning, assessment, feedback and reporting of student achievement in Mathematics.	1. Preparing Assessment in Mathematics 2. Retrospective Learning Sequence 3. Examination	Creative and critical thinkers. Engaged.
Demonstrate quality teaching strategies that support the diversity of learners in senior mathematics.	1. Retrospective Learning Sequence	Engaged.
Apply knowledge of the use of graphics calculators and other technologies to support the use of mathematical modelling and problem solving in mathematics.	1. Preparing Assessment in Mathematics 2. Retrospective Learning Sequence 3. Examination	Engaged. Creative and critical thinkers.

#### 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 Enrolment restrictions

(Enrolled in Program AE304 or SE303 or ED315 and a Mathematics teaching area) or enrolled in Program AB101, UU301, UU302 or XU301

##### 5.2 Pre-requisites

Nil

##### 5.3 Co-requisites

Nil

##### 5.4 Anti-requisites

Nil

##### 5.5 Specific assumed prior knowledge and skills (where applicable)

It is assumed that students have undertaken some tertiary Mathematics courses and these will be drawn upon in the course.

#### 6. How am I going to be assessed?

##### 6.1 Grading scale

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

## 6.2 Details of early feedback on progress

Feedback on the assessment tasks will be available during tutorials in Weeks 2 and 3.

## 6.3 Assessment tasks

Task No.	Assessment Tasks	Individual or Group	Weighting %	What is the duration / length?	When should I submit?	Where should I submit it?
1	Preparing Assessment in Mathematics	Individual	30%	1250 words	Friday 5pm Week 4	Safe Assign
2	Retrospective Learning Sequence	Individual	35%	1700 words	Friday 5pm Week 8	Safe Assign
3	Examination	Individual	35%	90 minutes	In lecture Week 10	In booklet provided
			100%			

### Assessment Task 1: Preparing Assessment in Mathematics

<b>Goal:</b>	This task allows you to develop your assessment skills and devise a summative assessment task and support materials that are consistent with Mathematics curriculum framework Year 11 and 12 requirements.
<b>Product:</b>	Formative and summative Task sheet, ISMG and justification statement
<b>Format:</b>	<p>For one of the General Mathematics syllabuses you will write an Internal Assessment 1 (IA1) – A problem-solving and modelling task and a short formative assessment task that will give students feedback prior to completing the Internal Assessment Item 1. You are required to create a task sheet and include the Instrument Specific Marking Guide (ISMG) suitable for a student cohort and aligned to the Unit 1 of your chosen curriculum. Your assessment item must include:</p> <ul style="list-style-type: none"> <li>• Knowledge of specific curriculum dimensions relevant to assessment design and reporting requirements</li> <li>• Application of a student-centred and engaging approach to assessment design</li> <li>• Alignment of unit learning objectives and assessment objectives</li> <li>• A short formative assessment piece that will scaffold students and provide feedback before the summative task</li> </ul> <p>You are also required to write a 500 word statement justifying the assessment task and support materials you designed. Your statement must outline the following:</p> <ul style="list-style-type: none"> <li>• Justification of how the task aligns with the curriculum and unit</li> <li>• Types of assessment approaches used to assess student learning</li> <li>• Purpose of formative assessment and feedback to students (including feedback, moderation and reporting)</li> </ul>
<b>Criteria:</b>	<p>You will be assessed on your:</p> <ul style="list-style-type: none"> <li>• Understanding and application of mathematics curriculum and assessment strategies</li> <li>• Justification of the alignment of your assessment tasks (Feedback, moderation and reporting)</li> <li>• Written communication and academic literacies including grammar, English expression, APA referencing conventions, and technical accuracy.</li> </ul>

**Assessment Task 2: Retrospective Learning Sequence**

<b>Goal:</b>	This task allows you to develop your ability to design a activities within a given unit overview
<b>Product:</b>	Retrospective Learning Sequence Development
<b>Format:</b>	<p>Using the Problem solving and modelling task you created in Assessment Task 1 or the sample Mathematics Method task supplied and the TLAP (Teaching, Learning and Assessment Plan) for either Consumer arithmetic (General Mathematics Unit 1) or Functions and Graphs ( Mathematics Methods Unit 1) to further develop 5 tasks in the TLAP. Include enough detail for someone else to teach from and your inquiry question(s). These will demonstrate:</p> <p>Knowledge and application of curriculum framework, principles of constructive alignment and assessment; including cognitive verbs.</p> <ul style="list-style-type: none"> <li>• Application of a student-centred pedagogy that caters for diverse learners</li> <li>• ICT resources and how these will be used to enhance learning</li> <li>• Problem solving and modelling activities</li> <li>• Strategies to teach literacy, numeracy, and 21<sup>st</sup> century skills as appropriate.</li> </ul> <p>You will also develop a 500-750 word pedagogical rationale for the teaching activities, focusing on open-ended questions, deeper level thinking and the coverage of part of the curriculum.</p>
<b>Criteria:</b>	<p>You will be assessed on your ability to:</p> <ul style="list-style-type: none"> <li>• Devise or source engaging activities with appropriate learning goals, cognitive verbs and inquiry question(s) which meet with syllabus requirements and academic rigour</li> <li>• Devise or source activities that have the potential to cater for diverse learners and include details of ICT, assessment, literacy, numeracy, and 21<sup>st</sup> century skills</li> <li>• Create a convincing unit rationale</li> <li>• Use written communication and academic literacies including grammar, English expression, APA referencing conventions, and technical accuracy.</li> </ul>

**Assessment Task 3: Teaching segment, lesson plan and reflection**

<b>Goal:</b>	The goal of this task is for you to demonstrate your knowledge and understanding of curriculum, pedagogy and assessment in senior phase mathematics.
<b>Product:</b>	Examination
<b>Format:</b>	<p>A 90-minute examination with short answer and scenario questions. You may bring in two A4 pages of notes. The following topics will be included:</p> <ul style="list-style-type: none"> <li>• Problem solving and modelling teaching and learning including the use of ICTS in senior secondary Mathematics</li> <li>• Assessment (formative and summative and their application), reporting (to students and parents/carers), feedback strategies and moderation in Mathematics</li> <li>• Strategies for differentiating teaching to meet the specific learning needs of student in Mathematics</li> </ul>
<b>Criteria:</b>	<p>You will be assessed on your:</p> <ul style="list-style-type: none"> <li>• Application of knowledge and understanding of teaching and learning strategies, concepts and processes in Mathematics</li> <li>• Application of knowledge and understanding of assessment processes (formative and summative) in Mathematics Implementation of</li> <li>• Knowledge of the role of ICT including graphics calculators in senior secondary Mathematics</li> <li>• Knowledge of Senior Secondary students.</li> <li>• Written communication and academic literacies including grammar, English expression, and technical accuracy.</li> </ul>

## 7. What are the course activities?

### 7.1 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. A blended learning approach is used to deliver this course, including a mix of synchronous and asynchronous materials and activities accessed through Blackboard. Directed study hours may vary by location. Student workload is calculated at 12.5 learning hours per one unit.

### 7.2 Course content

Week # / Module #	What key concepts/content will I learn?
<b>Module 1</b> <b>Weeks 1-3</b>	Senior Queensland Mathematics syllabi Curriculum design and assessment Contemporary teaching approaches in senior secondary mathematics Different types of assessment, feedback, moderation, reporting Assessment 'of, for and as' learning Evaluating student data and setting learning goals Modelling and problem solving
<b>Module 2</b> <b>Weeks 4-10</b>	Learning and teaching strategies, activities and resources Developing literacy and numeracy skills in mathematics Using graphics calculators and other technologies including ICT Teaching functions, rates of change and calculus, statistics, probability, geometry, etc. Planning a sequence of learning activities that develop a concept The use of questioning to diagnose student thinking to identify misconceptions and promote higher order thinking Embedding Aboriginal and Torres Strait Islander histories, culture and knowledges

Please note that the course content may be subject to variation.

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

Please note that 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)

Please note that you need to have regular access to the resource(s) listed below as they are required:

Author	Year	Title	Publisher
Goos, M., Stillman, G., and Vale, C.	2017	Teaching Secondary School Mathematics	Australia: Allen & Unwin

### 8.2 Specific requirements

Nil

## 9. Risk management

Health and safety risks for this course have been assessed as low.

It is your responsibility as a student 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. It is also your responsibility to familiarise yourself with the University's general health and safety principles by reviewing the online Health Safety and Wellbeing training module 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 will 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 and supply the required documentation to negotiate an outcome.

### 10.4 Study help

In the first instance, you should contact your tutor, then the Course Coordinator. Additional assistance is provided to all students through Academic Skills Advisers. To book an appointment or find a drop-in session go to [Student Hub](#).

Contact Student Central for further assistance: +61 7 5430 2890 or [studentcentral@usc.edu.au](mailto:studentcentral@usc.edu.au)

## 10.5 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>

## 10.6 General Enquiries

In person:

- **USC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **USC South Bank** - 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](mailto:studentcentral@usc.edu.au)

## 10.7 School Specific Information

The assessment tasks in this course support pre-service teachers to explicitly demonstrate the following Australian Professional Standards for Teachers (Graduate):

Assessment Task	Australian Professional Standards for Teachers (Graduate)
Task 1: Preparing Assessment in Mathematics	5.1 Demonstrate understanding of assessment strategies, including informal and formal, diagnostic, formative and summative approaches to assess student learning. 5.2 Demonstrate an understanding of the purpose of providing timely and appropriate feedback to students about their learning. 5.3 Demonstrate understanding of assessment moderation and its application to support consistent and comparable judgements of student learning. 5.4 Demonstrate the capacity to interpret student assessment data to evaluate student learning and modify teaching practice. 5.5 Demonstrate understanding of a range of strategies for reporting to students and parents/carers and the purpose of keeping accurate and reliable records of student achievement.
Task 2: Retrospective Unit Overview Development	2.1 Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area. 2.2 Organise content into an effective learning and teaching sequence. 2.3 Use curriculum, assessment and reporting knowledge to design learning sequences and lesson plans. 2.4 Demonstrate broad knowledge of, understanding of and respect for Aboriginal and Torres Strait Islander histories, cultures and languages. 2.5 Know and understand literacy and numeracy teaching strategies and their application in teaching areas. 2.6 Implement teaching strategies for using ICT to expand curriculum learning opportunities for students. 3.1 Set learning goals that provide achievable challenges for students of varying abilities and characteristics. 3.2 Plan lesson sequences using knowledge of student learning, content and effective teaching strategies. 3.3 Include a range of teaching strategies.

	<p>3.4 Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.</p> <p>3.6 Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.</p>
Task 3: Teaching segment, lesson plan and reflection	<p>3.1 Set learning goals that provide achievable challenges for students of varying abilities and characteristics.</p> <p>3.3 Include a range of teaching strategies.</p> <p>3.4 Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.</p> <p>3.5 Demonstrate a range of verbal and non-verbal communication strategies to support student engagement</p> <p>3.6 Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.</p>