

Course Outline

Code: EDU363

Title: Teaching Junior Secondary Mathematics

School:	Education
Teaching Session:	Semester 1
Year:	2019
Course Coordinator:	Dr Margaret Marshman Tel: 07 5459 4699 Email: mmarshma@ucs.edu.au
Course Moderator:	Assoc. Prof. 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 explores how you can use ICT as an effective learning tool in Mathematics for Years 7-10 learners. You will engage in curriculum, pedagogy and assessment practices and identify students' individual learning needs. You will adopt a student-centered approach to curriculum design, using the Australian Curriculum: Mathematics and evaluate teaching strategies used to enhance students' mathematical knowledge and disposition towards Mathematics.

1.2 Course topics

- Australian Curriculum: Mathematics – content and proficiency strands
- Concepts, principles and structure of mathematics pedagogy and content for Years 7 - 10
- Linking learning theory with practice through lesson planning and assessment design to support and extend learner's understanding in Mathematics
- Critically review research relating to cognition, culture, inclusion and equity, and consider the implications for practice
- Differentiation of curriculum, interdisciplinary approaches, differences in experiences of students, language use and transition from Primary schooling
- Relationship between mathematics, numeracy, and literacy
- Assessment, feedback and reporting in Mathematics including NAPLAN
- ICT applications in teaching, learning and communication with parents and carers

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?

Specific Learning Outcomes On successful completion of this course you should be able to:	Assessment Tasks You will be assessed on the learning outcome in task/s:	Graduate Qualities or Professional Standards mapping Completing these tasks successfully will contribute to you becoming:
Apply knowledge of Australian Curriculum, Year 7–10 mathematical content and pedagogies for inclusion, engagement and behaviour management to develop lesson plans in mathematics	Task 2	Knowledgeable. Empowered.
Apply knowledge of mathematical ideas, higher order thinking skills and inquiry-based pedagogies to design and reflect on classroom activities for year 7–10 secondary learners	Task 1 Task 2	Creative and critical thinkers.
Demonstrate an understanding of diverse student learning needs and adopt an ethical student-centred approach to teaching and assessment in mathematics	Task 1 Task 2 Task 3	Ethical. Knowledgeable.
Demonstrate an understanding of the relevant issues and the strategies available to support the safe, responsible and ethical use of ICT in learning and teaching.	Task 2 Task 3	Ethical. 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

Students must be enrolled in AE304, SE303, ED315, UU301 or XU301 plus Mathematics major or minor

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 expected that you will engage in this course when you have successfully studied some university Mathematics courses. This course will draw on your knowledge of Mathematics.

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 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	Case Study: Create a Diagnostic Task	Individual	30%	1000-word justification	Friday 4 pm Week 4	Blackboard (Safe Assign)
2a	Sequence of Lesson Plans	Group	15%	1200 words	Friday 4pm Week 6	Blackboard (Safe Assign)
2b	Teaching segment	Group	0%	15 - 20 minutes	Weeks 7, 8	In Tutorial
2c	Reflection and adapted lesson plan	Individual	25%	800 word reflection	Friday 4 pm Week 9	Blackboard (Safe Assign)
3	Examination	Individual	30%	80 minutes	Week 10	in Tutorial
			100%			

Assessment Task 1: Case Study: Create a Diagnostic Task

Goal:	The goal of this task is for you to demonstrate your ability to evaluate student data, create a diagnostic task for Year 7 – 10 secondary students, and justify the content of the task in relation to the student cohort
Product:	Case Study: Create a Diagnostic Task
Format:	<p>You are required to evaluate the Case Study and the student data supplied in your tutorial and create a diagnostic task. The task needs to enable your student cohort to demonstrate their knowledge and skills of one mathematical concept. The task must determine not only the students' answer but also their thinking around that concept.</p> <p>You must also supply an answer sheet that includes the understanding that leads to particular responses, that is, include some possible misconceptions that would be expected.</p> <p>You are also required to write a 1000-word justification statement, with reference to educational literature, on the task in relation to:</p> <ul style="list-style-type: none"> • The thinking behind common misconceptions of the concept • Suggested learning that would address these misconceptions • The literacy and numeracy skills required to complete the task successfully • Your understanding that Australia has two distinct Indigenous groups which have many Language Groups <p>You will need to refer to the literature to support your statements. Formative feedback may be obtained on the Diagnostic Task in weeks 2 and 3.</p>
Criteria:	<ol style="list-style-type: none"> 1. Knowledge and understanding of mathematical concepts and how to assess that understanding. 2. Evidence of teaching skills, to cater to diverse learner needs, including literacy and numeracy needs. 3. Evaluation of student data. 4. Use of evidence and sources 5. Written communication and academic literacies including grammar, English expression, APA referencing conventions, and technical accuracy.
Generic skill assessed	Skill assessment level
Information literacy	Graduate
Communication	Graduate

Assessment Task 2: a. Sequence of Lesson Plans, b. Teaching segment, c. Reflection & adapted lesson plan

Goal:	The goal of this task is for you to develop your ability to (1a) prepare a sequence of Mathematics lessons appropriate for the full range of student ability, (1b) teach a segment of the lesson to peers and then (1c) reflect and adapt the lesson plan for future use.	
Product:	a. Sequence of Lesson Plans, b. Teaching segment, c. Reflection & adapted lesson plan	
Format:	<p>A sequence of 2 inquiry or problem based lessons plans the first addressing a new mathematical concept. One of the lessons must utilise an ICT resource. A team teaching segment of one of these lessons will be taught during the tutorial and an individual reflection and adaptation of lesson plan.</p> <p>a: In groups of two, you are required to develop a sequence of two inquiry or problem based, 70-minute lesson plans for a Year 7 – 10 secondary class of 25 students addressing a new mathematical concept. One of the lessons must utilise an ICT resource. The lesson plan requirements will be provided on blackboard. Your group must submit your lesson plan in week 6 to Blackboard.</p> <p>b: Then team teach a 15 - 20-minute segment with the same group with whom you collaborated to create the lesson plans. The teaching sequence will be video-recorded.</p> <p>c: You will use this video to reflect as a group on your teaching performance using the critical moment protocols discussed in lectures. You will then write a personal reflection, revise one lesson plan from your sequence in response to your reflection and upload your reflection and revised lesson plan to Blackboard.</p>	
Criteria:	<ol style="list-style-type: none"> 1. Knowledge and understanding of Mathematics, Mathematics curriculum, teaching and learning applied in lesson planning. 2. Reflection and evaluation of lesson plan using the literature. 3. Written communication and academic literacies including grammar, English expression, APA referencing conventions, and technical accuracy. 	
Generic skill assessed		Skill assessment level
Applying technologies		Graduate
Communication		Graduate

Assessment Task 3: Examination

Goal:	The goal of this task is for you to demonstrate your knowledge and understanding of curriculum, pedagogy and assessment in relation to mathematics in the junior phase of secondary schooling.	
Product:	Examination	
Format:	<p>A 80-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"> • Inquiry based/ problem based teaching and learning in junior secondary Mathematics • Assessment (informal and formal, diagnostic, formative and summative and their application), reporting (to students and parents/carers) and feedback strategies in Mathematics • Strategies for differentiating teaching to meet the specific learning needs of student in Mathematics • Ethical use of ICT strategies and resources in curriculum, assessment and reporting 	
Criteria:	<ol style="list-style-type: none"> 1. Knowledge and understanding of teaching and learning strategies, concepts and processes in Mathematics. 2. Knowledge and understanding of assessment strategies, concepts and processes in Mathematics. 3. Knowledge of Junior Secondary learners. 4. Written communication and academic literacies including grammar, English expression, APA referencing conventions, and technical accuracy. 	
Generic skill assessed		Skill assessment level
Problem solving		Graduate
Applying technology		Graduate

7. What are the course activities?

7.1 Directed study hours

The directed study hours for this course are a portion of the workload for this course. A 12-unit course will have a 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

Teaching Week / Module	What key concepts/content will I learn?	What activities will I engage in to learn the concepts/content?	
		Directed Study Activities	Independent Study Activities
Module 1 Weeks 1 - 5	Curriculum design and teaching strategies in Mathematics	<p>Inquiry based pedagogies</p> <p>Exploring the Australian Curriculum: Mathematics (ACM) in Years 7–10: Content, General Capabilities and Cross Curriculum Priorities – literacy, numeracy, ICT, ATSI perspectives</p> <p>The use of questioning to diagnose student thinking and identify misconceptions</p> <p>Developing inquiry based activities</p> <p>Evaluating student data</p> <p>Exploring key reports, initiatives and policy in relation to mathematics</p> <p>Spatial thinking and reasoning</p>	<p>Text chapters: 1, 2, 3, 5</p> <p>Melbourne Declaration</p> <p>A Flying Start for QLD Children</p> <p>United in our pursuit of Excellence</p> <p>Keeping QLD Schools Safe</p> <p>QLD Closing the Gaps Report</p> <p>National Numeracy Review Report</p> <p>Towards a 10-year plan for STEM</p> <p>Further readings on Blackboard</p>
Module 2 Weeks 6 – 8	How to teach mathematics in Years 7–10 using the ACM	<p>Planning a sequence of learning activities that develop a mathematical concept</p> <p>Exploring number, algebra, measurement, geometry, statistics and probability content in relation to Years 7–10</p>	<p>Set text chapters: 4, 7 - 11</p> <p>Further readings and activities see Blackboard</p>
Module 3 Weeks 9 - 10	Assessment and reporting in mathematics	<p>Exploring different types of assessment, feedback, moderation, reporting in mathematics</p> <p>Examining theories on the purpose of assessment 'of, for and as' learning in mathematics</p>	<p>Set text chapters: 6, 16</p> <p>Further readings and activities see Blackboard</p>

Please note that the course activities 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. Vale, V., Makar, K. Herbert, S. and Geiger, V.	2017	Teaching Secondary School Mathematics: Research and Practice for the 21 st century. 2 nd edn	Australia: Allen & Unwin

8.2 Specific requirements

Nil

9. Risk management

Health and safety risks 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

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 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

Tel: +61 7 5430 2890

Email: 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: Case Study; Create a diagnostic test	2.1 Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area. 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. 3.6 Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning. 4.1 Identify strategies to support inclusive student participation and engagement in classroom activities. 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. 5.4 Demonstrate the capacity to interpret student assessment data to evaluate student learning and modify teaching practice.
Task 2: Lesson Plan, Teaching Segment and Reflection	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 2.5 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. 3.4 Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning. 3.5 Demonstrate a range of verbal and non-verbal communication strategies to support student engagement 3.6 Demonstrate broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning. 4.1 Identify strategies to support inclusive student participation and engagement in classroom activities. 4.2 Demonstrate the capacity to organise classroom activities and provide clear directions.
Task 3: Examination	1.1 Demonstrate knowledge and understanding of physical, social and intellectual development and characteristics of students and how these may affect learning. 2.5 Know and understand literacy and numeracy teaching strategies and their application in teaching areas. 3.4 Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning. 4.5 Demonstrate an understanding of the relevant issues and the strategies available to support the safe, responsible and ethical use of ICT in learning and teaching. 5.1 Demonstrate understanding of assessment strategies, including informal and formal,

Assessment Task	Australian Professional Standards for Teachers (Graduate)
	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. 5.5 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.