



TEP 430

Mathematics in the Secondary School II

S2 Day 2014

Education

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General Information

Unit convenor and teaching staff

Unit Convenor

Michael Cavanagh

michael.cavanagh@mq.edu.au

Contact via michael.cavanagh@mq.edu.au

Credit points

3

Prerequisites

TEP429(P) and (TEP401(S) or TEP414(S))

Corequisites

TEP402

Co-badged status

Unit description

This unit continues the examination of the secondary mathematics curriculum and its teaching. There are three main themes: understanding the central concepts of school calculus; teaching methods, including unit planning and the role of assessment in mathematics education; and practical and professional issues arising from students' concurrent professional experience in TEP402. Particular emphasis is given to learning and teaching mathematics in years 11 and 12.

Please consult the Secondary TEP Guide for recommended prior studies.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

1. Demonstrate knowledge and understanding of research into how students learn and the implications for teaching
2. Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the mathematics syllabuses
3. Plan lesson sequences using knowledge of student learning, content and effective teaching strategies

4. Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning
5. Demonstrate understanding of assessment strategies, including formal and informal, diagnostic, formative and summative approaches to assess student learning

Assessment Tasks

Name	Weighting	Due
Unit planning	25%	22/09/2014
Test development	45%	13/10/2014
JLP Portfolio	30%	17/11/2014

Unit planning

Due: **22/09/2014**

Weighting: **25%**

Select a unit of work from any senior mathematics course. (This could, but need not, be a unit you have taught or will be teaching at your school.) Then do the following:

1. Construct a plan for teaching this unit of work in 8 to 10 lessons (follow the normal lesson time for your school, or assume each lesson is 60 minutes long). Explain briefly your main aim for this unit, the content for each lesson, your rationale for your particular choice and sequence of topics, and the general approach you intend to take.

Your unit plan should not be longer than 2 pages. Please make sure you clearly identify the relevant course and syllabus section on which the unit is based.

2. Outline three consecutive lessons, selected from your unit plan, in more detail. At least one of these lessons should involve the use of technology, preferably by the students, and/or some kind of student group work task.

Each lesson outline should fit onto one to two pages. Ensure that you give all essential information (such as topic, outcomes, and resources to be used) as well as a projected timing for the various activities in each lesson. Do not append additional materials such as overheads and worksheets unless they are essential for understanding the lesson outline.

This assignment should be submitted to michael.cavanagh@mq.edu.au as a Word or PDF document no later than 4pm on Monday 22 September 2014. It is worth 25% of the unit grade. The criteria on which it will be graded are as follows.

- The structure and coherence of the unit plan
- The detail and appropriateness of the three lesson outlines
- The originality displayed in your design of the technology and group work activities

- The quality of the writing

(Graduate Teaching Standards: 2.1, 2.2, 3.3, 3.4)

On successful completion you will be able to:

- 1. Demonstrate knowledge and understanding of research into how students learn and the implications for teaching
- 2. Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the mathematics syllabuses
- 3. Plan lesson sequences using knowledge of student learning, content and effective teaching strategies
- 4. Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning

Test development

Due: **13/10/2014**

Weighting: **45%**

Select a unit of work from any **senior** mathematics course. Then plan a unit test designed to fit into a 60 minute lesson. You should do the following:

- Identify the syllabus content and outcomes taught in this unit and to be assessed in the test.
- Construct a design matrix for the unit test.
- Outline tasks which will enable students to demonstrate their achievement in each cell of your matrix. Group them into a smaller number of questions, and assign a maximum mark to each question.
- Assemble a first draft of the test paper. Work out possible “ideal” solutions and construct a detailed marking scheme. Indicate how you will convert total scores into Levels of Achievement.
- Show the test to your Mentor Teacher and at least one other mathematics teacher, and record their comments.
- Revise your test according to comments received.

Then you can compile your assignment ready for submission by including following:

1. *A reasoned plan for constructing the unit test.* Provide an outline of the unit and state the class to be taught and the outcomes to be tested. Present your design matrix and provide a justification for your selection, weighting and grouping of the assessment tasks. Also, indicate possible additional tasks which could be used to assess student

understanding of the unit outcomes, but which are unsuitable for assessment through a written test.

2. *The first draft of the test paper and marking scheme.* Include worked solutions and a clear marking scheme. This draft may be handwritten, but should include all necessary components (such as space for students to write their names).
3. *Your fellow teachers' comments.* Include, as appropriate, their annotated copies of your first draft, their written comments, and/or your record of their oral comments.
4. *A one-page evaluation of your first draft* in light of your colleagues' reactions.
5. *The revised test paper and marking scheme.* The test paper should be "camera ready" and prepared to the highest presentation standards. All text and formulae should be composed using the word processor and any diagrams should be either drawn using the word processor, scanned in or pasted on. The marking scheme may be hand-written, but it should be usable by any colleague without further explanation.

This assignment should be submitted to michael.cavanagh@mq.edu.au as a Word document no later than 4pm on Monday 13 October 2014. It is worth 45% of the unit grade.

The criteria on which it will be graded are:

- Inclusion of each of the five components listed above
- Evidence of research and creativity
- Reflective use of collegial criticism
- The appropriateness of your final test for the specified students
- The quality of the writing

(Graduate Teaching Standards: 5.1)

On successful completion you will be able to:

- 2. Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the mathematics syllabuses
- 5. Demonstrate understanding of assessment strategies, including formal and informal, diagnostic, formative and summative approaches to assess student learning

JLP Portfolio

Due: **17/11/2014**

Weighting: **30%**

The third assignment is a portfolio of two sections: (i) your reflections on the JLP process; and (ii) the comments you made on the Joint Lesson Presentation prepared by another group of students and assigned to you as a reactor.

As in TEP429, part (i) of your portfolio should contain the following items:

1. Your own (personal and independent) reflection on the JLP process including what you have learned through your work on the JLP, and any extra revisions you would like to make to the final draft [1-2 pages] (10%)

Your reaction to another group's JLP (10%)

1. Note: For (2), a marked copy of your reactor comments will be returned to you during the semester so there is no need to include that again.
2. Your JLP presentation will be assessed as Pass/Fail and is worth 10% of the unit grade.

This assignment should be submitted as follows:

- Part 1 should be submitted to michael.cavanagh@mq.edu.au as a Word or PDF document no later than 4pm on Monday 17 November 2014.
- Part 2 should be posted on the unit website according to the JLP schedule (see Section 3 above)
- Part 3 will be assessed as pass/fail on your class presentation and on the final draft of your JLP.

Assignment 3 is worth 30% of the unit grade. The criteria on which it will be graded are as follows.

- The originality, clarity and coherence of the lesson plan
- The appropriateness of your response to the reactors' comments
- The quality of your reactor comments

(Graduate Teaching Standards: 2.1, 2.2, 3.3, 3.4)

On successful completion you will be able to:

- 1. Demonstrate knowledge and understanding of research into how students learn and the implications for teaching
- 2. Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the mathematics syllabuses
- 3. Plan lesson sequences using knowledge of student learning, content and effective teaching strategies
- 4. Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning

Delivery and Resources

TEP430 is taught in weekly workshops (4-7pm each monday). Students are encouraged to bring

their own laptop, iPad, etc or to access and print the workshop materials from the unit iLearn page.

Students will require access to the internet to complete and submit their assignments which should be word processed.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcome

- 3. Plan lesson sequences using knowledge of student learning, content and effective teaching strategies

Assessment task

- Test development

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- 1. Demonstrate knowledge and understanding of research into how students learn and the implications for teaching
- 2. Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the mathematics syllabuses
- 3. Plan lesson sequences using knowledge of student learning, content and effective teaching strategies
- 4. Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning
- 5. Demonstrate understanding of assessment strategies, including formal and informal, diagnostic, formative and summative approaches to assess student learning

Assessment tasks

- Unit planning
- Test development
- JLP Portfolio

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- 1. Demonstrate knowledge and understanding of research into how students learn and the implications for teaching
- 3. Plan lesson sequences using knowledge of student learning, content and effective teaching strategies

Assessment tasks

- Unit planning
- Test development
- JLP Portfolio

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be

imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcome

- 3. Plan lesson sequences using knowledge of student learning, content and effective teaching strategies

Assessment tasks

- Unit planning
- JLP Portfolio

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcome

- 3. Plan lesson sequences using knowledge of student learning, content and effective teaching strategies

Assessment tasks

- Unit planning
- Test development
- JLP Portfolio

Changes since First Published

Date	Description
28/02/2014	The Description was updated.