



# EDTE434

## Science in the Secondary School II

S2 Day 2019

*Department of Educational Studies*

### Contents

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<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	7
<u>Delivery and Resources</u>	9
<u>Unit Schedule</u>	10
<u>Policies and Procedures</u>	11
<u>Graduate Capabilities</u>	12

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#### **Disclaimer**

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## General Information

### Unit convenor and teaching staff

#### Convenor

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#### Lab technician

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### Credit points

3

### Prerequisites

TEP401(S) and (TEP433 or EDTE433)

### Corequisites

TEP402

### Co-badged status

### Unit description

This unit builds on EDTE433. Curricula, resources and instructional strategies appropriate for the teaching of Biology, Chemistry, Physics, and Earth and Environmental Sciences for Senior Science in Years 11 and 12 are examined. It is linked to the school experience gained in TEP402.

## 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:

Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the science syllabuses (Physics, Chemistry, Biology and Earth & Environmental Science)

Demonstrate understanding of assessment strategies, including formal and informal,

diagnostic, formative and summative approaches to assess student learning  
Plan lesson sequences using knowledge of student learning, content and effective teaching strategies

Demonstrate the ability to interpret research findings both in science and science education and relate these where appropriate to current syllabus documents and to the lives of adolescent students;

Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning

Develop oral communication skills, listening skills, and teamwork skills

## General Assessment Information

### *Submitting Assignments*

- Assignments 1 and 2 (except lesson plan) should be about 1500-2000 words in length, word-processed and designed in such a way as to benefit your own understanding of the science teaching process. It should be well written and reflect your own opinions and demonstrate critical thinking ability.
- Reference your work using the current APA style. Consult the APA style guide located on the Library website.
- Make sure you keep a copy of your assignment in case it gets lost.

Please follow these guidelines when you submit each assignment:

- Allow a left and right-hand margin of at least 2cm in all assignments.
- Please type all assignments using 12-point font and 1.5 spacing.
- All assessments must be submitted through Turnitin in .doc or .pdf format
- It is the onus of the student to ensure that all assessments are successfully submitted through Turnitin.
- Faculty assignment cover sheets are NOT required.

### Draft Submissions & Turnitin Originality Reports

- Students may use Turnitin's Originality Report as a learning tool to improve their academic writing if this option is made available in the unit.
- Students are strongly encouraged to upload a draft copy of each assessment to Turnitin at least one week prior to the due date to obtain an Originality Report.
- The Originality Report provides students with a similarity index that may indicate if plagiarism has occurred. Students will be able to make amendments to their drafts prior to their final submission on the due date.
- Generally, one Originality Report is generated every 24 hours up to the due date.

When preparing your assignments, it is essential that:

- Students regularly save a copy of all assignments before submission,
- Unless there are exceptional circumstances, no assessment will be accepted after the date that the assessment has been returned to other students.
- If an assessment is considered to be below the passing standard, another staff member on the unit will provide a second opinion. Failed assessments cannot be resubmitted as they are all double-marked as a part of the moderation process.

Final Submissions

- Students are responsible for checking that their submission has been successful and has been submitted by the due date and time.

### ***Assignment extensions and late penalties***

Applications for extensions must be made via AskMQ at <https://ask.mq.edu.au> as a Special Consideration request before the submission date. Students who experience a disruption to their studies through ill-health or misadventure are able to apply for this request. Extensions can only be granted if they meet the Special Considerations policy and are submitted via <https://ask.mq.edu.au/>. This will ensure consistency in the consideration of such requests is maintained.

In general, there should be no need for extensions except through illness or misadventure that would be categorised as unavoidable disruption according to the University definition of same, see: <https://students.mq.edu.au/study/my-study-program/special-consideration>

Late submissions without extension will receive a penalty of 5% reduction of the total possible mark for each day late (including weekends and public holidays). You are reminded that submitting even just 1 day late could be the difference between passing and failing a unit. Late penalties are applied by unit convenors or their delegates after tasks are assessed.

No assessable work will be accepted after the return/release of marked work on the same topic. If a student is still permitted to submit on the basis of unavoidable disruption, an alternative topic may be set.

Students should keep an electronic file of all assessments. Claims regarding "lost" assessments cannot be made if the file cannot be produced. It is also advisable to keep an electronic file of all drafts and the final submission on a USB untouched/unopened after submission. This can be used to demonstrate easily that the assessment has not been amended after the submission date.

### ***Special Considerations***

The Special Consideration provision is to support students who have been impacted by circumstances that are unexpected, unavoidable, significantly disruptive and beyond the student's control, and which may affect their performance in assessment.

The University classifies a circumstance as serious and unavoidable if it:

- could not have reasonably been anticipated, avoided or guarded against by the student; and
- was beyond the student's control; and
- caused substantial disruption to the student's capacity for effective study and/or completion of required work; and
- occurred during an event critical study period and was at least three (3) consecutive days duration, and/or
- prevented completion of an assessment task scheduled for a specific date (e.g. final examination, in class test/quiz, in class presentation).

The following link takes you to the Special Considerations policy, which makes clear the ways in which you can apply for special consideration in times of difficulty.

<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

### ***Requesting a remark of an assignment***

If you have evidence that your task has been incorrectly assessed against the grade descriptors you can request a re-mark. To request a remark you need to contact the unit convenor within 7 days of the date of return of the assignment and provide a detailed assessment of your script against the task criteria. Evidence from your assignment must be provided to support your judgments.

Please note: The outcome of a re-marks may be a higher/lower or unchanged grade. Grades are *standards referenced* and effort is NOT a criterion.

### ***University policy on grading***

- Criteria for awarding grades for assessment tasks
- Assignments will be awarded grades ranging from HD to F according to guidelines set out in the University's Grading Policy. The following descriptive criteria are included for your information.

#### ***Descriptive Criteria for awarding grades in the unit***

In order to meet the unit outcomes and successfully pass this unit, students must make a genuine attempt at all assessment tasks. Where any submitted assessment task is considered to be unsatisfactory in this regard, the highest possible final grade that can be awarded for the unit will be 45.

Students will be awarded grades ranging from HD to F according to guidelines set out in the policy: <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/assessment-in-effect-from-session-2-2016>

The following generic grade descriptors provide university-wide standards for awarding final grades.

Grade	Descriptor
HD (High Distinction)	Provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application as appropriate to the discipline.
D (Distinction)	Provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.
Cr (Credit)	Provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; convincing argumentation with appropriate coherent justification; communication of ideas fluently and clearly in terms of the conventions of the discipline.
P (Pass)	Provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; routine argumentation with acceptable justification; communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes
F (Fail)	Does not provide evidence of attainment of learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; missing, undeveloped, inappropriate or confusing argumentation; incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.

Note: If you fail a unit with a professional experience component the fail grade will be on your transcript irrespective of the timing of the placement.

### ***Withdrawing from this UG Unit***

If you are considering withdrawing from this unit, please seek academic advice via <https://ask.mq.edu.au> before doing so as this unit may be a co-requisite or prerequisite for units in the following sessions and may impact on your progression through the degree.

### ***Results***

Results shown in iLearn, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](https://ask.mq.edu.au).

\*\*Please include the following two paragraphs in your unit guide if relevant

Units with Submissions of Family & Children’s Records : Some assessment tasks require students to submit records about families and about children and their learning. It is expected that the records submitted are original, authentic, adhere to ethical practices and are the work of the student. Issues with the authenticity of such records will be investigated for possible forgery. Please note that submitted records can only be used once for assessment purposes.

### ***Confidentiality***

Students must respect the need for sensitivity and confidentiality, and ensure that privacy obligations are met. There should be nothing in assessment submissions that identifies a centre or school. Use pseudonyms for any children or adults referred to in the assignment. Do not record details that enable identification of a site, or of children or adults.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Current science issues</u>	40%	No	13 Sep 2019 (W7)
<u>Teaching and assessment</u>	50%	No	8 Nov 2019
<u>Engagement</u>	10%	No	all weeks

### Current science issues

Due: **13 Sep 2019 (W7)**

Weighting: **40%**

The purpose of this task is for you to consider media reports of recent breakthroughs in science research and their place within the stage 6 science syllabus (Physics, Chemistry, Biology, Earth and Environmental Science) in Year 11. This assignment is an opportunity for you to develop the skill of interpreting research findings in science to relate them to the lives of adolescents.

Two 20% tasks: one in 1st teaching subject and the other in 2nd teaching subject.

On successful completion you will be able to:

- Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the science syllabuses (Physics, Chemistry, Biology and Earth & Environmental Science)
- Plan lesson sequences using knowledge of student learning, content and effective teaching strategies
- Demonstrate the ability to interpret research findings both in science and science education and relate these where appropriate to current syllabus documents and to the lives of adolescent students;
- Demonstrate knowledge of a range of resources, including ICT, that engage students in

their learning

## Teaching and assessment

Due: **8 Nov 2019**

Weighting: **50%**

The purpose of this task 2 is for you to become familiar with the stage 6 science syllabus (Physics, Chemistry, Biology, Earth and Environmental Science) in Year 12 and assessment. This task 2 has two components - written (40%) and science practical activity (10%). You must complete both components.

On successful completion you will be able to:

- Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the science syllabuses (Physics, Chemistry, Biology and Earth & Environmental Science)
- Demonstrate understanding of assessment strategies, including formal and informal, diagnostic, formative and summative approaches to assess student learning
- Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning
- Develop oral communication skills, listening skills, and teamwork skills

## Engagement

Due: **all weeks**

Weighting: **10%**

Consistently contributes to group activities and discussion including online environments; consistently responds very thoughtfully to other students' comments.

On successful completion you will be able to:

- Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the science syllabuses (Physics, Chemistry, Biology and Earth & Environmental Science)
- Demonstrate understanding of assessment strategies, including formal and informal, diagnostic, formative and summative approaches to assess student learning
- Plan lesson sequences using knowledge of student learning, content and effective teaching strategies
- Demonstrate the ability to interpret research findings both in science and science education and relate these where appropriate to current syllabus documents and to the



lives of adolescent students;

- Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning
- Develop oral communication skills, listening skills, and teamwork skills

## Delivery and Resources

### 1. About this unit

This unit builds on the EDTE 433, TEP401 and TEP395. Curricula, resources and instructional strategies appropriate for the teaching of Biology, Chemistry, Physics and Earth and Environmental Sciences and General Science for Senior Science Years 11-12 are examined. The EDTE 434 is linked to professional experience gained in TEP 401/402. Students complete methodology studies in two of the four science specialist areas listed below but may attend all areas if they want to.

Students must take a major option (science subject studied to the third year at university) and a minor option (science subject studied to at least first year and preferably to the second year at university).

### 2. Classes

*EDTE Science Laboratory E7B317 - the location of all classes*

The Science Curriculum Laboratory is available for EDTE 434 student use. At times the laboratory is closed so that workshops can be prepared. Students are asked not to disturb the laboratory staff at these times. There will be some variations in opening times during the semester - students are asked to double check on these times. Please phone/email Ms. Kanoun to check the availability of the laboratory ahead of time.

In the interests of safety and security, students are asked to inform the laboratory assistant when entering and leaving the area. You are required to wear appropriate shoes and safety glasses at all times when conducting experimental work. Doors must be left locked. *Note:* Children are NOT permitted in the Laboratory OR the Preparation Room.

All workshops focus on strategies for teaching these subjects at the senior level and assume a level of content knowledge covered by the respective syllabus documents. Each subject area will incorporate relevant aspects of the Stage 6 General Science Syllabus. If your content knowledge of chemistry or physics is inadequate and you wish to attend these workshops, then it is advisable to complete first-year units in chemistry or physics or to revise the relevant areas prior to the workshops each week.

### 3. Readings and resources

Recommended Readings:

Hassard, J., & Dias, M. (2009). *The art of teaching science: Inquiry and innovation in middle school and high school*. New York: Routledge.

Harrison, A., & Coll, R. (Eds.) (2008). *Using analogies in middle and secondary science*

*classrooms*. Thousand Oaks: Corwin Press.

Lewis, C.C., & Hurd, J. (2011). *Lesson study step by step: How teacher-learning communities improve instruction*. Portsmouth, NH: Heinemann.

NSW Education Standards Authority (2017). *Science Stage 6 Syllabuses*. Sydney: NESA.

Rapporteur, M. H. (2010). *Exploring the intersection of science education and 21st-century skills: a workshop summary*. Washington, D.D: The National Academies Press.

Venville, G., & Dawson, V. (Eds.). (2012). *The art of teaching science: For middle and secondary school*. Sydney: Allen & Unwin.

William, D. & Thompson, M. (2007). *Integrating assessment with instructions: What will it take to make it work?* In C. A. Dwyer (Ed.), *The future of assessment: Shaping teaching and learning*. Mahwah, NJ: Lawrence Erlbaum.

Xiufeng Lui. (2010). *Essentials of science classroom assessment*. London: SAGE. Some useful websites:

NSW Education Standards Authority, Years 11-12

<https://arc.nesa.nsw.edu.au/go/hsc/>

NSW Education Standards Authority, Stage 6 syllabus

<https://syllabus.nesa.nsw.edu.au/stage-6/>

NSW Department of Education

<https://education.nsw.gov.au/teaching-and-learning/school-learning-environments-and-change/school-journeys>

AAAS Science Assessment

<http://assessment.aaas.org/>

Australian Academy of Science

<https://www.science.org.au/>

AISTL, Lesson Study

<https://www.aitsl.edu.au/tools-resources/resource/lesson-study>

International Journal of Lesson Study

<http://www.emeraldinsight.com/doi/full/10.1108/20468251311323397>

## Unit Schedule

The schedule of weekly workshop is available from the EDTE434 iLearn page.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## 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](https://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](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

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

## Graduate Capabilities

### 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 outcomes

- Plan lesson sequences using knowledge of student learning, content and effective teaching strategies
- Demonstrate the ability to interpret research findings both in science and science education and relate these where appropriate to current syllabus documents and to the lives of adolescent students;
- Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning

### Assessment tasks

- Current science issues
- Teaching and assessment

- Engagement

## 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

- Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the science syllabuses (Physics, Chemistry, Biology and Earth & Environmental Science)
- Demonstrate understanding of assessment strategies, including formal and informal, diagnostic, formative and summative approaches to assess student learning
- Plan lesson sequences using knowledge of student learning, content and effective teaching strategies
- Demonstrate the ability to interpret research findings both in science and science education and relate these where appropriate to current syllabus documents and to the lives of adolescent students;
- Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning
- Develop oral communication skills, listening skills, and teamwork skills

### Assessment tasks

- Current science issues
- Teaching and assessment
- Engagement

## 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

- Demonstrate knowledge and understanding of the concepts, substance and structure of the content and strategies of Stage 6 of the science syllabuses (Physics, Chemistry, Biology and Earth & Environmental Science)
- Demonstrate understanding of assessment strategies, including formal and informal, diagnostic, formative and summative approaches to assess student learning
- Plan lesson sequences using knowledge of student learning, content and effective teaching strategies
- Demonstrate the ability to interpret research findings both in science and science education and relate these where appropriate to current syllabus documents and to the lives of adolescent students;
- Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning
- Develop oral communication skills, listening skills, and teamwork skills

## Assessment tasks

- Current science issues
- Teaching and assessment
- Engagement

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

## Learning outcome

- Demonstrate the ability to interpret research findings both in science and science education and relate these where appropriate to current syllabus documents and to the lives of adolescent students;

## Assessment tasks

- Current science issues
- Teaching and assessment
- Engagement

## 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

- Develop oral communication skills, listening skills, and teamwork skills

### Assessment tasks

- Teaching and assessment
- Engagement