



EDST8228

Teaching Science in the Secondary School 1

Session 2, In person-scheduled-infrequent, North Ryde 2023

Macquarie School of Education

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General Information

Unit convenor and teaching staff

Convenor

Hye Eun Chu

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Contact via Via email

Lab Technician

Sunny Kim

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Contact via Via email

E7B, Science Edu Lab 317

9:00 to 12:00

Credit points

10

Prerequisites

Corequisites

EDST8237

Co-badged status

Unit description

This unit introduces students to modern approaches to the teaching and learning of Science in secondary schools. Curricula, resources and instructional strategies appropriate to teaching Science are analysed and evaluated with a particular focus on years 7-10 Science. The units emphasises researched-informed approaches to the theory and practice of science and includes opportunities for individual research, collegial learning and connection with the teaching profession.

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:

ULO1: Articulate knowledge of the relevant science syllabus documents from both the NESAs (NSW Education Standards Authority) and Australia Curriculum (AC).

ULO2: Critically analyse and demonstrate understanding of a range of modern teaching and learning strategies related to the content of Stages 4 and 5 of the science syllabus.

ULO3: Demonstrate the ability to interpret research findings both in science and science education and relate these where appropriate to adolescents' understandings in science, their lives and to current syllabus documents.

ULO4: Plan and implement critically reflective units of work in science that provide achievable challenges for students from diverse backgrounds and abilities.

ULO5: Explore and critique educational ideas and practice using research methods appropriate to practitioner inquiry.

ULO6: Communicate knowledge using effective communication skills using a range of modes and mediums and for a range of purposes and audiences.

General Assessment Information

- Students should be aware of and apply the University policy on academic honesty (see: <https://policies.mq.edu.au/document/view.php?id=3>)
- Unless a Special Consideration (see: <https://students.mq.edu.au/study/assessment-exams/special-consideration>) request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a mark of, 0 (zero) will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11:55pm. A 1-hour grace period is provided to students who experience a technical issue. This late penalty will apply to non-timed sensitive assessment (incl essays, reports, posters, portfolios, journals, recordings etc).
- Late submission of time sensitive tasks (such as tests/exams, performance assessments/presentations, scheduled practical assessments/labs etc) will only be addressed by the unit convenor in a Special consideration application. Special Consideration outcome may result in a new question or topic.
- Please format assessments using 12-point font and 1.5 spacing.
- All assessments are submitted electronically. Turnitin plagiarism detection software is used to check all written assessments.
- Students can use Turnitin's Originality Report as a learning tool to improve their academic writing if this option is made available in the unit.
- Students should carefully check that they submit the correct file for an assessment as no re-submissions will be accepted after the due date and time, including instances where students upload an incorrect file in error.
- Word limits are strictly applied. Work above the word limit will not be marked.

- All assessments are marked using a clear marking scheme or a rubric.
- Marking of all assessments is moderated by the Unit Convenor.
- Applications for extensions must be made via AskMQ (<https://ask.mq.edu.au/>).
- It is **not the responsibility** of unit staff to contact students who have failed to submit assessments. If you have any missing items of assessment, it is your responsibility to make contact with the unit convenor.

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 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.

Assessment Tasks

Name	Weighting	Hurdle	Due
Teaching resource	40%	No	23:55 27/08/2023
Professional Portfolio	50%	No	23:55 05/11/2023
Professional dialogue and participation including online dialogue.	10%	No	On going

Teaching resource

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 30 hours

Due: **23:55 27/08/2023**

Weighting: **40%**

Reflective inquiry-based activity design (including ICT based activity design, Limit: 2000word)

On successful completion you will be able to:

- Articulate knowledge of the relevant science syllabus documents from both the NESA (NSW Education Standards Authority) and Australia Curriculum (AC).
- Critically analyse and demonstrate understanding of a range of modern teaching and learning strategies related to the content of Stages 4 and 5 of the science syllabus.
- Plan and implement critically reflective units of work in science that provide achievable challenges for students from diverse backgrounds and abilities.
- Communicate knowledge using effective communication skills using a range of modes and mediums and for a range of purposes and audiences.

Professional Portfolio

Assessment Type ¹: Portfolio

Indicative Time on Task ²: 40 hours

Due: **23:55 05/11/2023**

Weighting: **50%**

Teaching and learning unit and resources. Research and practice-informed unit of work demonstrating understanding of a science concept/beliefs (including unit of work, Limit: 2000 words).

On successful completion you will be able to:

- Articulate knowledge of the relevant science syllabus documents from both the NESA (NSW Education Standards Authority) and Australia Curriculum (AC).
- Critically analyse and demonstrate understanding of a range of modern teaching and learning strategies related to the content of Stages 4 and 5 of the science syllabus.
- Plan and implement critically reflective units of work in science that provide achievable challenges for students from diverse backgrounds and abilities.

Professional dialogue and participation including online dialogue.

Assessment Type ¹: Participatory task

Indicative Time on Task ²: 10 hours

Due: **On going**

Weighting: **10%**

Professional dialogue and participation including online dialogue.

On successful completion you will be able to:

- Articulate knowledge of the relevant science syllabus documents from both the NESA (NSW Education Standards Authority) and Australia Curriculum (AC).
- Critically analyse and demonstrate understanding of a range of modern teaching and learning strategies related to the content of Stages 4 and 5 of the science syllabus.
- Demonstrate the ability to interpret research findings both in science and science education and relate these where appropriate to adolescents' understandings in science, their lives and to current syllabus documents.
- Explore and critique educational ideas and practice using research methods appropriate to practitioner inquiry.
- Communicate knowledge using effective communication skills using a range of modes and mediums and for a range of purposes and audiences.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

This unit has a full web presence through *iLearn*.

Students will need regular access to a computer and the Internet to complete this unit.

Weekly access to iLearn is compulsory for all students. Important assessment information will be posted here, as will other relevant unit notices and materials, including a reading template and guide to interactive lecture note taking to assist your studies.

Various activities and materials for discussion and critical reflection are included and students enrolled in INFQ mode are especially encouraged to use this web component. Electronic links and suggested references will be included in the Resources section. Please check the iLearn unit regularly.

The interactive lectures, slides, and readings are available on the ilearn page. You must read and listen to all interactive lecture materials if you do not attend these 'live'.

PowerPoint slides are available in iLearn in advance of the weekly workshop and/or are available in the Active Learning Tool.

Access and technical assistance

Information for students about access to the online component of this unit is available at <https://ilearn.mq.edu.au/login/index.php>. You will need to enter your student username and password.

Please do **NOT** contact the Unit Convenor regarding *iLearn* technical help.

Assistance is available from IT Helpdesk

Ph: 9850 4357 or 1800 67 4357

Log a request: help.mq.edu.au.

On Campus: Ground floor at 18 Wally's Walk

Structure

The unit structure can be found in the university timetable <https://timetables.mq.edu.au/>

In the tutorial students will discuss issues and questions arising from the interactive lectures and prescribed readings. They are expected to base their arguments/discussions on evidence from published research and other relevant material. There will be a supporting website for the unit providing additional readings, links and materials. Some of Lectures will also be available through Echo in iLearn from the following website link: <http://ilearn.mq.edu.au>

Students are required to participate in small group activities, whole class discussion, to read the weekly material in advance, and to complete brief tasks either as individuals or in pairs. The weekly program for the course with the accompanying readings/ preparation is available on the following pages or on the unit iLearn site.

Unit Schedule

Please refer to the unit iLearn site.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). 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](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

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

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/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 or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

School of Education Procedures

In addition, the following policies and procedures of the School of Education are applicable in this unit.

Attendance for Master of Teaching (Primary and Secondary) units

*Attendance at all synchronous activities, completion of non-synchronous formative/diagnostic class tasks and involvement in professional forums is **compulsory** as the Master of Teaching is a professional qualification. All students must meet the 80% attendance requirement.*

Activities completed during tutorials or on campus days are essential for building the core knowledge and/or skills required to demonstrate the learning outcomes of this unit and to meet the AITSL Graduate Teacher Standards. Attendance at all tutorials or on campus days is expected and the roll will be taken.

Students are required to attend the tutorial in which they are enrolled. Any changes to tutorial enrolments must be completed officially through e-student. Please do not contact the unit convenor requesting a change.

Electronic Communication

It is the student's responsibility to check all electronic communication on a regular weekly basis. Communication may occur via:

- Official MQ Student Email Address
- The Dialogue function on iLearn

- Other iLearn communication functions

Student Support

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

The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit 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.

5Rs Framework

Ready to learn:

As part of this unit, student teachers will develop their identity as future science teachers in secondary schools. In addition, student teachers will watch prepared videos to identify areas they need to develop.

Research Engaged and Reflexive:

In the "Students' Understanding of Science Concept/Beliefs" assignment (Task 2), student teachers will investigate school students' alternative conceptions during their teaching practice and design their follow-up lessons to help their students overcome difficulties of conceptual understanding. The assignment includes evidence collection and analysis to create the follow-up lessons