EDST8229

Teaching Science in the Secondary School 2

Session 1, In person-scheduled-infrequent, North Ryde 2024

Macquarie School of Education

Contents

General Information

Unit convenor and teaching staff
Convenor
Hye Eun Chu
hye-eun.chu@mq.edu.au
Contact via Email
29ww, room 237
2:00 to 4:00pm

Lab Technician
Sunny Kim
sunny.kim@mq.edu.au
E7B, Science Edu Lab 317
9:00 to 12:00

Credit points
10

Prerequisites
EDST8228 and EDST8237

Corequisites

Co-badged status

Unit description
This unit continues the examination of the secondary Science curriculum and builds on the content and strategies covered in EDST8228. It considers the key concepts in Biology/ Chemistry/Physics/Earth and Environmental Science in the Stage 6 syllabus, appropriate research-informed teaching methods for developing these concepts, and the role of assessment in Science education in Years 11 and 12. Students will critically reflect on practical and professional issues relating to the key concepts, and teaching and assessment methods they encountered in their professional experience.

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: Develop and integrate an in-depth, broad and coherent knowledge of the key concepts in syllabus, substance and structure of the content and strategies of teaching in Stage 6 of the science (Physics, Chemistry, Biology and Earth & Environmental Science syllabuses).
ULO2: Develop and integrate an in-depth, broad and coherent knowledge of key concepts in Stage 6 syllabus to understand assessment strategies, including formal and informal, diagnostic, formative and summative approaches to assess student learning.
ULO3: Plan, evaluate lessons and critically reflect on learning and teaching sequences using in-depth knowledge of student learning, content and evidence-based teaching strategies.
ULO4: Demonstrate effective oral communication skills, listening skills, and teamwork skills suitable for a range of professional contexts relevant to Science teaching.
ULO5: Engage in scholarly inquiry and critical reflection in relation to research- informed teaching practice.

General Assessment Information

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 request (see: https://students.mq.edu.au/study/assessment-exams/special-consideration) 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.

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. For Professional Experience (PEx) units the PE Report is marked as satisfactory or unsatisfactory and the Teaching Performance Assessment (in final PE units) is marked as not meets, meets or exceeds. The following descriptive criteria are included for your information.

Descriptive Criteria for awarding grades in the unit

To meet the unit outcomes and successfully pass this unit, students should attempt all assessment tasks.

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 course progression.

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.*

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Assessment Tasks

Name	Weighting	Hurdle	Due
Critical Reflections A: Major Option	30%	No	23:55, 22/03/2024
Critical Reflections B: Minor Option	30%	No	23:55, 28/03/2024
Assessment Resource and Scholarly Justification	30%	No	23:55, 4/06/2024
Professional dialogue, engagement and participation in the unit activities.	10%	No	All semester

Critical Reflections A: Major Option

Assessment Type [1]: Reflective Writing
Indicative Time on Task [2]: 20 hours
Due: **23:55, 22/03/2024**

Weighting: **30%**

Critical reflections on learning and teaching sequences, for the Syllabus Major option. Research-based reflections on unit plan, individual lessons planning, and pedagogical choices (1000 words)

On successful completion you will be able to:

- Develop and integrate an in-depth, broad and coherent knowledge of the key concepts in syllabus, substance and structure of the content and strategies of teaching in Stage 6 of the science (Physics, Chemistry, Biology and Earth & Environmental Science syllabuses).
- Plan, evaluate lessons and critically reflect on learning and teaching sequences using in-depth knowledge of student learning, content and evidence-based teaching strategies.
- Demonstrate effective oral communication skills, listening skills, and teamwork skills suitable for a range of professional contexts relevant to Science teaching.
- Engage in scholarly inquiry and critical reflection in relation to research- informed teaching practice.

Critical Reflections B: Minor Option

Assessment Type [1]: Reflective Writing
Indicative Time on Task [2]: 20 hours
Due: **23:55, 28/03/2024**
Weighting: **30%**

Critical reflections on learning and teaching sequences, for the Syllabus Major option. Research-based reflections on unit plan, individual lessons planning, and pedagogical choices (1000 words)

On successful completion you will be able to:

- Develop and integrate an in-depth, broad and coherent knowledge of the key concepts in syllabus, substance and structure of the content and strategies of teaching in Stage 6 of the science (Physics, Chemistry, Biology and Earth & Environmental Science syllabuses).

- Plan, evaluate lessons and critically reflect on learning and teaching sequences using in-depth knowledge of student learning, content and evidence-based teaching strategies.
- Demonstrate effective oral communication skills, listening skills, and teamwork skills suitable for a range of professional contexts relevant to Science teaching.
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Assessment Resource and Scholarly Justification

Assessment Type [1]: Practice-based task
Indicative Time on Task [2]: 30 hours
Due: **23:55, 4/06/2024**
Weighting: **30%**

Design an assessment of learning task and justification: The test and accompanying justification will show scholarly, research-informed knowledge of science teaching and Syllabus documents (1000 words)

On successful completion you will be able to:

- Develop and integrate an in-depth, broad and coherent knowledge of the key concepts in syllabus, substance and structure of the content and strategies of teaching in Stage 6 of the science (Physics, Chemistry, Biology and Earth & Environmental Science syllabuses).
- Develop and integrate an in-depth, broad and coherent knowledge of key concepts in Stage 6 syllabus to understand assessment strategies, including formal and informal, diagnostic, formative and summative approaches to assess student learning.
- Demonstrate effective oral communication skills, listening skills, and teamwork skills suitable for a range of professional contexts relevant to Science teaching.

Professional dialogue, engagement and participation in the unit activities.

Assessment Type [1]: Participatory task
Indicative Time on Task [2]: 10 hours
Due: **All semester**
Weighting: **10%**

Professional dialogue, engagement and participation in the unit activities.

5% for major option 5% for minor option

On successful completion you will be able to:

- Demonstrate effective oral communication skills, listening skills, and teamwork skills suitable for a range of professional contexts relevant to Science teaching.
- Engage in scholarly inquiry and critical reflection in relation to research- informed teaching practice.

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[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

Information about the unit iLearn site

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.

Various activities and materials for discussion and critical reflection are included. Please check the iLearn unit regularly.

PowerPoint slides are available in iLearn following each of the workshops.

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. No extensions will be given for any technical issues. Allow enough time for your submissions.

Assistance is available from IT Helpdesk for both sudents and staff.

Ph: 9850 4357 or 1800 67 4357

Email: help.mq.edu.au.

On Campus: Ground floor at 18 Wally's Walk

This unit requires students to use several ICT and software skills: • Internet access: The iLearn site contains materials for this unit; it is also required for the online submission of all Assessment Tasks, and for the use of Turnitin submission for ALL tasks. • Word processing, visual representations, and document formatting: You are required to use an appropriate form of software to present your assignments. • Uploading of assessment tasks to iLearn.

Structure

Student teachers must take two online tutorials and two workshops every time, one for a major option (1st science teaching subject) and the other one for a minor option (2nd science teaching subjects or preferable science teaching subject science).

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 scince (biology, chemistry, physics, or earth and environmetal science) is inadequate and you wish to attend these workshops, then it is advisable to complete first-year/second year units in these four science subjects or to revise the relevant areas prior to the tutorial and workshops each week.

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

In this tutorial, student teachers will discuss workshop materials and readings, basing arguments on published research. A supporting website offers extra resources and recorded lectures are available weekly on the iLearn page at http://ilearn.mq.edu.au.

During on-campus workshops, student teachers will develop skills in integrating scientific conceptual knowledge with hands-on practical experiences, especially for Stage 6 contexts. This includes planning, practicing, and experiencing these methods. Participation in group activities, class discussions, advance reading, and task completion is required. The weekly program and materials are available on the iLearn site.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (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/su

pport/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) 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 workshops 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 workshops is expected and the roll will be taken.

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

The 5Rs Framework, developed by the School of Education at Macquarie University, is embedded throughout your teacher education course. Your use of the 5Rs Framework will help you develop the capabilities that will make your teaching career sustainable and fulfilling.

Research engaged:

In the "Stage 6 Lesson Plan" assignment (Task 1) student teachers will interpret recent science research findings to relate them to people's lives within stage 6 contents.

Responsive:

In the "Teaching and Assessment" assignment (Task2), student teachers will be responsive by giving and receiving peer-feedback on their delivered lab practical activity to teach and assess science concepts in stage 6.

Unit information based on version 2024.01R of the Handbook