EDTE4330

Science in the Secondary School I

Session 2, In person-scheduled-weekday, North Ryde 2024

Macquarie School of Education

Contents

Disclaimer

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General Information

Unit convenor and teaching staff Anna Mang anna.mang@mq.edu.au
Credit points 10
Prerequisites 130cp at 1000 level or above including (EDTE3870 or TEP387 or EDST3140)
Corequisites EDST3010
Co-badged status
Unit description This unit introduces students to modern approaches for the teaching and learning of Science in secondary schools. Curricula, resources and instructional strategies appropriate to teaching Science are examined, with particular attention to years 7-10 Science.

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:** Demonstrate knowledge of the content of Stages 4 and 5 science of the current NSW 7-10 syllabus and impending NSW syllabus for the Australian Curriculum.
>
> **ULO2:** Demonstrate understanding of a range of teaching strategies related to the content of Stages 4 and 5 of the science syllabuses.
>
> **ULO3:** Implement teaching strategies for using ICT that engage students in their learning.
>
> **ULO4:** Demonstrate knowledge and understanding of research into how students learn science concepts.
>
> **ULO5:** Demonstrate knowledge and understanding of strategies for differentiating teaching to meet specific learning needs of students across a range of backgrounds and abilities.

ULO6: Plan and implement effective science lessons that provide achievable challenges for students of varying backgrounds and abilities.

ULO7: Explore educational ideas through action research.

ULO8: Develop communication skills.

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
Reflective inquiry based activity design	40%	No	16 Aug 2024, 11:55PM
Students' understanding of a science concept/ beliefs	50%	No	5 Nov 2024, 11:55PM
participation and engagement	10%	No	All weeks

Reflective inquiry based activity design

Assessment Type [1]: Design Task
Indicative Time on Task [2]: 30 hours
Due: **16 Aug 2024, 11:55PM**
Weighting: **40%**

The aim of the assignment is to give you the opportunity to develop your expertise in inquiry-based, student-centred science teaching by using this approach in one lesson of your choice and engaging in reflection on this lesson. (1600-2000 words).

On successful completion you will be able to:
- Demonstrate knowledge of the content of Stages 4 and 5 science of the current NSW 7-10 syllabus and impending NSW syllabus for the Australian Curriculum.
- Demonstrate understanding of a range of teaching strategies related to the content of Stages 4 and 5 of the science syllabuses.
- Implement teaching strategies for using ICT that engage students in their learning.
- Demonstrate knowledge and understanding of strategies for differentiating teaching to meet specific learning needs of students across a range of backgrounds and abilities.
- Plan and implement effective science lessons that provide achievable challenges for students of varying backgrounds and abilities.
- Develop communication skills.

Students' understanding of a science concept/beliefs

Assessment Type [1]: Case study/analysis
Indicative Time on Task [2]: 35 hours
Due: **5 Nov 2024, 11:55PM**
Weighting: **50%**

The aim of this assignment is to provide you with the opportunity to develop research skills for diagnosing and solving problems in the classroom (1600-2000 words)

On successful completion you will be able to:
- Demonstrate knowledge of the content of Stages 4 and 5 science of the current NSW 7-10 syllabus and impending NSW syllabus for the Australian Curriculum.
- Demonstrate understanding of a range of teaching strategies related to the content of Stages 4 and 5 of the science syllabuses.
- Demonstrate knowledge and understanding of research into how students learn science concepts.
- Demonstrate knowledge and understanding of strategies for differentiating teaching to meet specific learning needs of students across a range of backgrounds and abilities.
- Plan and implement effective science lessons that provide achievable challenges for students of varying backgrounds and abilities.
- Explore educational ideas through action research.
- Develop communication skills.

participation and engagement

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

Professional dialogue and participation including online dialogue.

On successful completion you will be able to:
- Demonstrate knowledge of the content of Stages 4 and 5 science of the current NSW 7-10 syllabus and impending NSW syllabus for the Australian Curriculum.
- Demonstrate understanding of a range of teaching strategies related to the content of Stages 4 and 5 of the science syllabuses.
- Implement teaching strategies for using ICT that engage students in their learning.
- Demonstrate knowledge and understanding of research into how students learn science concepts.
- Demonstrate knowledge and understanding of strategies for differentiating teaching to meet specific learning needs of students across a range of backgrounds and abilities.
- Plan and implement effective science lessons that provide achievable challenges for students of varying backgrounds and abilities.
- Explore educational ideas through action research.

[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, including a reading template and guide to lecture note taking to assist your studies.

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

Weekly workshop notes, ppt slides, lab guidelines, and materials are available on the iLearn page. You must read workshop notes and complete group/individual tasks on provided online bulletin board if you do not attend these face to face 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 ph: 1800 67 4357, or log a request at help.mq.edu.au. OneHelp is the online IT support service for both students and staff.

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

Students are required to participate in small group activities, whole-class discussions, to read the weekly materials in advance, and to complete brief tasks either as individuals or in groups. The weekly program for the course with the accompanying readings/ lab preparation is available on the unit iLearn site, http://ilearn.mq.edu.au.

Unit Schedule

Please refer to the unit iLearn page for information about the schedule of classes

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/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) 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 undergraduate units See the university timetable for information about when classes begin in this unit. Creating your timetable - Enrolling | Macquarie University, Sydney (m

q.edu.au)

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. Make up tasks may be given if attendance is missed to ensure all content is covered to meet accreditation requirements.

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

Fail Rule General Coursework Rule 17 stipulates that where a student is enrolled in a practical, clinical or Professional course with fitness to practice requirements:

- if a student fails one practical, clinical or professional activity they may be permanently excluded from that course; or
- if a student fails an essential unit twice or fails the equivalent of 20 credit points they may be permanently excluded from further enrolment in that course

Students completing a double degree will be able to continue with their other degree program provided they meet the academic progression requirements of the Academic Progression Policy.

Students completing a single Education degree (such as the BTeach/MTeach) are advised to seek academic advice.

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. In this unit, you will learn using the 5Rs framework in the following important ways:

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.

Unit information based on version 2024.02 of the Handbook