EDST4160

Design of STEM Education

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

Macquarie School of Education

Contents

General Information	2
Learning Outcomes	2
Assessment Tasks	3
Delivery and Resources	4
Policies and Procedures	5

General Information

Unit convenor and teaching staff
Bronwyn Tregenza
bronwyn.tregenza@mq.edu.au

Credit points
10

Prerequisites
EDST4110

Corequisites
EDST4040

Co-badged status

Unit description
This unit builds students' personal conceptual knowledge of design thinking, focusing on its integration with Science, Technology, Engineering and Mathematics (STEM) knowledge and its application to solve authentic problems or meet needs, wants or opportunities existing in 'real world' contexts. The project-based approach requires students to research and develop a personal STEM investigation including phases of conceptualisation, design/planning, prototyping, implementation and evaluation. The unit models e-portfolio assessment as a means of collating and presenting data and information from the investigations.

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: Explain the multi-faceted nature of carrying out a STEM-based investigation, including social, cultural, economic, environmental, personal constraints and considerations that need to be taken into account when developing solutions.
ULO2: Explain the role of design thinking when researching, conceptualising and planning a STEM-based solution to an identified problem, need, want or opportunity.
ULO3: Illustrate the contribution that Science, Technology, Engineering and Mathematics make to the design and development of solutions to problems, needs, wants or opportunities.

ULO4: Demonstrate understanding of how the knowledge generated from their personal STEM investigation relates to classroom STEM teaching and learning.
ULO5: Use digital technologies to scaffold STEM inquiries for learners.

Assessment Tasks

Name	Weighting	Hurdle	Due
STEM investigation	50%	No	2024-08-16
STEM unit of learning	50%	No	2024-10-28

STEM investigation

Assessment Type [1]: Report
Indicative Time on Task [2]: 29.5 hours
Due: **2024-08-16**
Weighting: **50%**

Research, design and plan a personal STEM investigation that involves the integration of mathematics, science, engineering and technological knowledge and skills (eg., working scientifically/technologically) and follows a design thinking process.

On successful completion you will be able to:

- Explain the multi-faceted nature of carrying out a STEM-based investigation, including social, cultural, economic, environmental, personal constraints and considerations that need to be taken into account when developing solutions.
- Explain the role of design thinking when researching, conceptualising and planning a STEM-based solution to an identified problem, need, want or opportunity.
- Illustrate the contribution that Science, Technology, Engineering and Mathematics make to the design and development of solutions to problems, needs, wants or opportunities.
- Demonstrate understanding of how the knowledge generated from their personal STEM investigation relates to classroom STEM teaching and learning.
- Use digital technologies to scaffold STEM inquiries for learners.

STEM unit of learning

Assessment Type [1]: Learning plan
Indicative Time on Task [2]: 29.5 hours
Due: **2024-10-28**

Weighting: **50%**

Develop and evaluate a unit of work that school students can complete that engages them in a process similar to your personal STEM investigation completed in Task 1.

On successful completion you will be able to:

- Explain the role of design thinking when researching, conceptualising and planning a STEM-based solution to an identified problem, need, want or opportunity.
- Illustrate the contribution that Science, Technology, Engineering and Mathematics make to the design and development of solutions to problems, needs, wants or opportunities.
- Demonstrate understanding of how the knowledge generated from their personal STEM investigation relates to classroom STEM teaching and learning.
- Use digital technologies to scaffold STEM inquiries for learners.

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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

Students in this course are expected to commit fully to the following program of activities.

Weekly Attendance Mode

- View ***and respond*** to 1 x 1hr weekly recorded lecture
- Attend 1 x 3hr Tutorial on Monday 11:00am to 2:00pm OR Monday 3:00pm to 6:00pm, **beginning Week 1 Monday 22 July**
- Read ***and respond*** to up to 3 texts per week
- Complete practical tasks to cultivate, reinforce and demonstrate skills learned in class

Infrequent Mode

- View and respond to lectures 1 to 4 ***before*** Friday 9 August
- View and respond to lectures 9 to 12 ***before*** Friday 18 October
- Attend ***both*** Infrequent Days on **Saturday 10 August and Saturday 19 October from**

9:00am to 4:00pm

- Read and respond to readings from Weeks 1 to 4 ***before*** Friday 9 August
- Read and respond to readings from Weeks 9 to 12 ***before*** Friday 18 October
- Complete set practical tasks to cultivate, reinforce and demonstrate skills learned in class

Please Note:

- Class attendance is expected and all absences should have a Special Consideration application via AskMQ.
- Equipment for practical components of the course will be scanned out and returned during tutorials
- Tutorials introduce skills essential to the assessment tasks
- **Tutorials commence Monday Week 1 which is 22 July**

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 connect.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.

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 the Service Connect Portal, 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.

Unit information based on version 2024.02 of the Handbook