UNSW Course Outline

EDST1200 Foundations of Science in Education - 2024

Published on the 12 May 2024

General Course Information

Course Code : EDST1200
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Arts, Design and Architecture
Academic Unit : School of Education
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

As a pre-service teacher, this introductory course provides you with a foundation to primary school scientific subjects and content. You will study concepts from the earth, space, biological, and physical sciences as they relate to the following subjects: Living Things, Earth and Space,

Environment and Natural Phenomena, Energy and Electricity, Chemical Properties and Reactions, and Forces and Movement. This unit also aims at developing your skills in communicating scientific findings and using technology for teaching.

Course Aims

This introductory course aims to provide preservice teachers with a foundation to primary school scientific subjects and content.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Demonstrate an understanding of the content within primary school science
CLO2 : Demonstrate an understanding of how to apply the scientific method to conduct scientific investigations within the primary school classroom
CLO3 : Identify how various technologies can be applied across a range of activities
CLO4 : Communicate science to a range of audiences

Course Learning Outcomes	Assessment Item
CLO1 : Demonstrate an understanding of the content within primary school science	• Science Experiment Design and Performance • Science Communication
CLO2 : Demonstrate an understanding of how to apply the scientific method to conduct scientific investigations within the primary school classroom	• Science Experiment Design and Performance
CLO3 : Identify how various technologies can be applied across a range of activities	• Science Communication • Science Experiment Design and Performance
CLO4 : Communicate science to a range of audiences	• Science Communication

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

Course content will be covered in lectures, online asynchronous activities and independent reading. The course combines a range of teaching and learning activities including asynchronous

lectures, synchronous weekly tutorials and online discussion activities.

Other Professional Outcomes

AUSTRALIAN PROFESSIONAL STANDARDS FOR TEACHERS

Standard		Assessment/s
1.2.1	Demonstrate knowledge and understanding of research into how students learn and the implications for teaching.	2
2.1.1	Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.	1
2.6.1	Implement teaching strategies for using ICT to expand curriculum learning opportunities for students.	1, 2
3.4.1	Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.	1, 2
3.5.1	Demonstrate a range of verbal and non-verbal communication strategies to support student engagement.	2
4.5.1	Demonstrate an understanding of relevant issues and the strategies available to support the safe, responsible, and ethical use of ICT in learning and teaching.	1, 2

NATIONAL PRIORITY AREA ELABORATIONS

	Priority area		Assessment/s
A	Aboriginal and Torres Strait Islander Education.	14-15	1, 2
B	Classroom Management.	1	1
C	Information and Communication Technologies.	1-7, 12	1, 2
D	Literacy and Numeracy.	1, 6	1
E	Students with Special Educational Needs.	8	1
F	Teaching Students from Non-English-Speaking Backgrounds.	5	1

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Science Experiment Design and Performance Assessment Format: Individual	50%	Due Date: 30/06/2024 05:00 PM
Science Communication Assessment Format: Individual	50%	Due Date: 21/07/2024 05:00 PM

Assessment Details

Science Experiment Design and Performance

Assessment Overview

Indicative length: 2000 words. Pre-service teachers will design, then carry out a science experiment based on a chosen content strand, from Living World, Material World, Physical World or Earth and Space. Preservice teachers will formulate a testable hypothesis before performing the experiment and then reporting the results as a formal scientific investigation. Use of technology must be integrated and embedded into the method.

Feedback provided via LMS.

Course Learning Outcomes

- CLO1 : Demonstrate an understanding of the content within primary school science
- CLO2 : Demonstrate an understanding of how to apply the scientific method to conduct scientific investigations within the primary school classroom
- CLO3 : Identify how various technologies can be applied across a range of activities

Detailed Assessment Description

- The assignment is to be written as a report text-type.
- Photographs from the experiment should be included within the report.

Assessment Length

2000 words

Assessment information

• RUBRIC/FEEDBACK SHEET EDST1200 UNSW SCHOOL OF EDUCATION • Assessment Task 1: Science Experiment Design and Performance • Specific Criteria and Grading (FL/PS/CR/DN/HD)	
• Understanding of the question or issue and the key concepts involved • Demonstrates an understanding of the underlying scientific principles of the chosen strand • Demonstrates an understanding of how to carry out a scientific investigation / experiment • Technology integrated successfully	
• Depth of analysis and critique in response to the task • Method, Results, and Discussion sections of report show scientific reasoning and holistic analysis • Technology integration enhances the experiment, and is not just an unnecessary addition	
• Familiarity with and relevance of professional and/or research literature used to support response • Relevant academic literature cited in the Introduction and Discussion sections of the report	
• Structure and organisation of response • Appropriate structure, language use, and organisation of a Report text type	
• Presentation of response according to appropriate academic and linguistic conventions • Accurate use of standard academic Australian English writing convention including grammar and punctuation • 7th APA referencing style	
• General comments/recommendations for next time:	
• Lecturer: • Recommended: /20 (FL PS CR DN HD)	• Date: • Weighting: 50%
• NB: The ticks in the various boxes are designed to provide feedback to students; they are not given equal weight in determining the recommended grade. Depending on the nature of the assessment task, lecturers may also contextualise and/or amend these specific criteria. The recommended grade is tentative only, subject to standardisation processes and approval by the School of Education Learning and Teaching Committee.	

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Hurdle rules

A hurdle requirement or hurdle rule is a course requirement that must be fulfilled in order to pass the course. In all courses within the School of Education, all assessments (regardless of their weighting) are hurdle requirements. That is, all assessments in a course must receive a pass

mark in order to pass the course. Where a student has failed to meet the requirements of an assessment, they may still be deemed to have met the hurdle requirement if the failure was due to a late penalty and if the overall mark for the course is still greater than 50.

Science Communication

Assessment Overview

Indicative length: 2000 words. Pre-service teachers will create a slide presentation and associated audio/video recording communicating the background, method and results from their experiment conducted for Assignment 1. The target audience is a class at primary school level. An interactive element (incorporating technology) must be included in the presentation (in the form of a quiz, poll or similar).

Feedback provided via LMS.

Course Learning Outcomes

- CLO1 : Demonstrate an understanding of the content within primary school science
- CLO3 : Identify how various technologies can be applied across a range of activities
- CLO4 : Communicate science to a range of audiences

Detailed Assessment Description

Peers will view the presentations and provide feedback to the presenter in the form of a self-constructed peer assessment.

Assessment Length

2000 words

Assessment information

• RUBRIC/FEEDBACK SHEET EDST1200 UNSW SCHOOL OF EDUCATION • Assessment Task 2: Science Communication • Specific Criteria and Grading (FL/PS/CR/DN/HD)	
• Understanding of the question or issue and the key concepts involved • Demonstrates an understanding of the underlying scientific principles of the chosen strand • Technology integrated successfully • Demonstrates an understanding of how to communicate to a primary school-aged audience	
• Depth of analysis and critique in response to the task • Presentation goes into detail on the background, method, and results of the experiment • Technology chosen is appropriate, entertaining, serves a purpose, and enhances the overall presentation	
• Familiarity with and relevance of professional and/or research literature used to support response • Relevant academic literature cited in the explanation of the background and results of the experiment	
• Structure and organisation of response • Slide show constructed in a way that communicates the message clearly and is aesthetically pleasing • Technology integration is seamless within the presentation	
• Presentation of response according to appropriate academic and linguistic conventions • Accurate use of standard academic Australian English writing convention including grammar and punctuation • 7th APA referencing style	
• General comments/recommendations for next time:	
• Lecturer: • Recommended: /20 (FL PS CR DN HD)	• Date: • Weighting: 50%
• NB: The ticks in the various boxes are designed to provide feedback to students; they are not given equal weight in determining the recommended grade. Depending on the nature of the assessment task, lecturers may also contextualise and/or amend these specific criteria. The recommended grade is tentative only, subject to standardisation processes and approval by the School of Education Learning and Teaching Committee.	

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General Assessment Information

Students are required to follow their course convenor's instructions when submitting their work for assessment. All assessment task/s are to be submitted online via Moodle by 5pm. Students are also required to retain all drafts, original data, and other evidence of the authenticity of the work for at least one year after submission/examination. For more detailed information about submission, late penalties, special consideration, and the like, visit the School of Education website on policies and procedures: SED Policies and Procedures (unsw.edu.au).

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	• Introduction to Primary School Science The place of Science in the Primary Curriculum What is taught in K-6 Science?
	Tutorial	• Topics covered in K-6 Science • Equipping students with scientific skills • How to think and work scientifically
Week 2 : 3 June - 9 June	Lecture	• Living Things The “Living World” strand Life cycles, adaptations and behaviours
	Tutorial	• Experiment 1: Genetics • Experiment 2: Evolution and Natural Selection • Experiment 3: Evolution
Week 3 : 10 June - 16 June	Lecture	• Earth and Space The “Earth and Space” strand (Part 1) Day and night and seasons Earth’s processes
	Tutorial	• Experiment 1: The Solar System • Experiment 2: Earth’s Resources • Experiment 3: The Atmosphere
Week 4 : 17 June - 23 June	Lecture	• Environment and Natural Phenomena The “Earth and Space” strand (Part 2) Weather Natural Phenomena The Environment
	Tutorial	• Experiment 1: Day and Night • Experiment 2: Weather • Experiment 3: Climate Change
Week 5 : 24 June - 30 June	Lecture	• Energy and Electricity The “Physical World” strand (Part 1) Light, sound and heat
	Tutorial	• Experiment 1: Kinetic Energy • Experiment 2: Circuits • Experiment 3: Voltage and Current
Week 6 : 1 July - 7 July	Lecture	• Flexibility Week • Asynchronous • Chemical Properties and Reactions The “Material World” strand Chemicals and chemical reactions
	Tutorial	• Asynchronous • Experiment 1: Matter • Experiment 2: Atoms • Experiment 3: Chemical Reactions
Week 7 : 8 July - 14 July	Lecture	• Forces and Movement The “Physical World” strand (Part 2) The relationship between forces and energy Contact and non-contact forces Motion and movement
	Tutorial	• Experiment 1: Non-contact forces • Experiment 2: Simple Machines • Experiment 3: Friction
Week 8 : 15 July - 21 July	Lecture	• Effective Science Communication What makes a good science communicator? Why communicate science anyway?
	Tutorial	• Essential skills for communicating science • Analysis of science communication methods • Targeting your audience
Week 9 : 22 July - 28 July	Lecture	• Effective use of Technology The place of technology in the K-6 curriculum The place of technology in the 21st Century Classroom
	Tutorial	• Ideas and resources for technology integration in the K-6 Classroom • The TPACK Framework – Technological, Pedagogical and Content Knowledge
Week 10 : 29 July - 4 August	Lecture	• Working Scientifically What does it mean to “Work Scientifically?” Why do we need this in the K-6 Syllabus? Aligning science with the Australian Professional Standards for Teachers
	Tutorial	• Science processing skills – skills for life • How we work scientifically, and why it matters

Attendance Requirements

The School of Education has a minimum attendance requirement of 80% for classes, including

lectures, tutorials, seminars, and other learning activities – irrespective of delivery mode. The attendance requirement is a minimum threshold for engagement and ensures that programs meet the requirements of external accreditation authorities (i.e., NESA), and for a range of programs (e.g., initial teacher education programs and other accredited postgraduate coursework specialisations). Students must register their attendance according to the course convenor's directions.

General Schedule Information

This course outline sets out the description of classes at the date the outline is published. The nature of classes may change during the term after the course outline is published. Moodle should be consulted for up-to-date class descriptions. If there is an inconsistency in the description of activities between the University timetable and the course outline (as updated in Moodle), the description in the course outline on Moodle applies.

Course Resources

Prescribed Resources

- Skamp, K. and Preston, C. (eds) (2020). *Teaching Primacy Science Constructively*, 7th ed. Cengage Learning.

Recommended Resources

Recommended readings

- Allen, M. (2019). *Misconceptions in primary science*. (3rd ed.). Open University Press.
- Bybee, R. W. (2009). *The BSCS 5e instructional model and 21st century skills*. A commissioned paper prepared for a workshop on exploring the intersection of science education and the development of 21st century skills. Retrieved from https://sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_073327.pdf
- Dawson, V., & Venville, G.(Eds.). (2022). *The art of teaching primary school science* (2nd ed.). Allen & Unwin.
- Devereux, J., and Open University. (2007). *Science for primary and early years: developing subject knowledge* (2nd ed.). Thousand Oaks, CA: SAGE Publications.
- Fleer, M., Jane, B., & Hardy, T. (2007). *Science for children: Developing a personal approach to teaching* (3rd ed.). Pearson.
- Fitzgerald, A. (2012). *Science in primary schools: Examining the practices of effective teachers*. Sense Publishers.
- Harlen, W. (2015. *Working with big ideas of science education*. Trieste, Italy: Science Education Programme of IAP. Accessed www.interacademies.net/publications/26703.apx
- Loxley, P., Dawes, L., Nicholls, L., & Dore, B. (2017). *Teaching primary science: Promoting enjoyment and developing understanding* (3rd ed.). Taylor and Francis.
- McComas, W. F. (1996). Ten myths of science: Reexamining what we think we know about the

nature of science. *School Science and Mathematics,* 96(1), 10-16.
- Pascoe, B. (2018). *Dark Emu: Aboriginal Australia and the birth of agriculture*. Australia Magabala Books.

Recommended websites

- https://tesep.org.au/
- https://www.teachengineering.org/
- http://www.rsc.org/education/teachers/resources/aflchem/
- https://phet.colorado.edu/en/simulations
- http://thescienceteacher.co.uk/atomicstructure/

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Lachlan Hart				Email to arrange an appointment	No	Yes

Other Useful Information

Academic Information

Due to evolving advice by NSW Health, students must check for updated information regarding online learning for all Arts, Design and Architecture courses this term (via Moodle or course information provided).

Please see: https://www.unsw.edu.au/arts-design-architecture/student-life/resources-support/protocols-guidelines for essential student information relating to:

- UNSW and Faculty policies and procedures;
- Student Support Services;
- Dean's List;
- review of results;
- credit transfer;
- cross-institutional study and exchange;
- examination information;
- enrolment information;
- Special Consideration in the event of illness or misadventure;
- student equity and disability;

And other essential academic information.

Academic Honesty and Plagarism

Plagiarism is using the words or ideas of others and presenting them as your own. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement.

UNSW groups plagiarism into the following categories:

- Copying: Using the same or very similar words to the original text or idea without acknowledging the source or using quotation marks. This includes copying materials, ideas or concepts from a book, article, report or other written document, presentation, composition, artwork, design, drawing, circuitry, computer program or software, website, internet, other electronic resource, or another person's assignment without appropriate acknowledgement.
- Inappropriate paraphrasing: Changing a few words and phrases while mostly retaining the original information, structure and/or progression of ideas of the original without acknowledgement. This also applies in presentations where someone paraphrases another's ideas or words without credit and to piecing together quotes and paraphrases into a new whole, without appropriate referencing.
- Collusion: Working with others but passing off the work as a person's individual work. Collusion also includes providing your work to another student for the purpose of them plagiarising, paying another person to perform an academic task, stealing or acquiring another person's academic work and copying it, offering to complete another person's work or seeking payment for completing academic work.
- Inappropriate citation: Citing sources which have not been read, without acknowledging the "secondary" source from which knowledge of them has been obtained.
- Duplication ("self-plagiarism"): Submitting your own work, in whole or in part, where it has previously been prepared or submitted for another assessment or course at UNSW or another university.

The UNSW Academic Skills support offers resources and individual consultations. Students are also reminded that careful time management is an important part of study. One of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and proper referencing of sources in preparing all assessment items. UNSW Library has the ELISE tool available to assist you with your study at UNSW. ELISE is designed to introduce new students to studying at UNSW, but it can also be a great refresher during your study.

Completing the ELISE tutorial and quiz will enable you to:

- analyse topics, plan responses and organise research for academic writing and other assessment tasks
- effectively and efficiently find appropriate information sources and evaluate relevance to your

needs
- use and manage information effectively to accomplish a specific purpose
- better manage your time
- understand your rights and responsibilities as a student at UNSW
- be aware of plagiarism, copyright, UNSW Student Code of Conduct and Acceptable Use of UNSW ICT Resources Policy
- be aware of the standards of behaviour expected of everyone in the UNSW community
- locate services and information about UNSW and UNSW Library

Use of AI for assessments

As AI applications continue to develop, and technology rapidly progresses around us, we remain committed to our values around academic integrity at UNSW. Where the use of AI tools, such as ChatGPT, has been permitted by your course convener, they must be properly credited and your submissions must be substantially your own work.

In cases where the use of AI has been prohibited, please respect this and be aware that where unauthorised use is detected, penalties will apply.

Use of AI for assessments | UNSW Current Students

Submission of Assessment Tasks

Turnitin Submission

If you encounter a problem when attempting to submit your assignment through Turnitin, please telephone External Support on 9385 3331 or email them on externalteltsupport@unsw.edu.au

Support hours are 8:00am – 10:00pm on weekdays and 9:00am – 5:00pm on weekends (365 days a year). If you are unable to submit your assignment due to a fault with Turnitin, you may apply for an extension, but you must retain your ticket number from External Support (along with any other relevant documents) to include as evidence to support your extension application. If you email External Support, you will automatically receive a ticket number, but if you telephone, you will need to specifically ask for one. Turnitin also provides updates on their system status on Twitter.

Generally, assessment tasks must be submitted electronically via either Turnitin or a Moodle assignment. In instances where this is not possible, alternative submission details will be stated on your course's Moodle site. For information on how to submit assignments online via Moodle: https://student.unsw.edu.au/how-submit-assignment-moodle

Late Submission Penalty

UNSW has a standard late submission penalty of:

- 5% per calendar day,
- for all assessments where a penalty applies,
- capped at five calendar days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Students are expected to manage their time to meet deadlines and to request Special Consideration as early as possible before the deadline. Support with Time Management is available here.

School-specific Information

Policies and Procedures

For more detailed information about School of Education policies and procedures visit the following website: SED Policies and Procedures (unsw.edu.au).

School Contact Information

School of Education. Arts, Design and Architecture. Ground Floor, Morven Brown Building (Map Reference F20).

- T: +61 2 93851977
- E: education@unsw.edu.au
- W: https://www.arts.unsw.edu.au/education