SCIE11023 *Scientific Research Fundamentals*
Term 1 - 2026

Profile information current as at 21/04/2026 08:47 pm

All details in this unit profile for SCIE11023 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student).The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview
In this unit, you will explore, synthesise and apply the fundamentals of the scientific method. You will develop skills in scientific communication beyond reading and writing - through a series of seminars, lectures and self-guided tasks students will learn appropriate manipulation of mathematical and statistical data as well as data presentation. You will enhance your knowledge and understanding of a range of fundamental scientific concepts and consider issues relating to ethics, experimentation and professional practice. Finally, through conducting your own research activity, you will learn how to develop a research framework and apply critical thinking to solve complex problems.

Details
Career Level: *Undergraduate*
Unit Level: *Level 1*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites
There are no requisites for this unit.
Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the Assessment Policy and Procedure (Higher Education Coursework).

Offerings For Term 1 - 2026
- Online
- Rockhampton

Attendance Requirements
All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website
This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

Regional Campuses
Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

Metropolitan Campuses
Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. Written Assessment
Weighting: 15%
2. Presentation
Weighting: 35%
3. Portfolio
Weighting: 50%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the University's Grades and Results Policy for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the CQUniversity Policy site.
You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the CQUniversity Policy site.

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Email, in-person

Feedback
Some students suggested they would have preferred out-of-hours live contact opportunities, as the ones offered were during their working hours.

Recommendation
It was noted several times through term that students could request out-of-hours live Zoom meetings (some did). For the next offering, the recommendation is to make this option clearer to students.

Feedback from SUTE feedback

Feedback
One student noted that the unit did not challenge them and they lost interest in it.

Recommendation
While this is unfortunate and not communicated until SUTE feedback arrived, it is recommended to maintain the academic level of the unit given the relatively bell-shaped grade distribution suggests the expectations are about right.

Feedback from Email, in-person

Feedback
Two students appeared somewhat 'put off' that teaching staff would not read and correct drafts of their assessments.

Recommendation
The recommendation is to maintain the approach of not reading and correcting drafts as it would need to be offered to all students and add to an already onerous marking load. Instead, the use of exemplars showing HD, passing, and fail-quality assessments will be continued.

Feedback from SUTE feedback

Feedback
Several students noted the conceptually linked nature of the assessments helped them gain a thorough understanding of the subject matter.

Recommendation
Maintain the current linked assessment structure for the 2026 offering.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Explain and apply information and numerical literacy skills to communicate scientific knowledge and ideas clearly and coherently to a variety of audiences
2. Formulate a research hypothesis and research questions that include relevant ethical considerations
3. Conduct and manage a small research project using quantitative, qualitative or mixed methods research methodologies
4. Analyse, interpret and explain scientific data, resulting in the production of a research report appropriate for an e-portfolio.

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level • Introductory Level • Intermediate Level • Graduate Level ◦ Professional Level ◦ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Written Assessment - 15%	•			
2 - Presentation - 35%	•	•	•	
3 - Portfolio - 50%	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Communication	•	•	•	•
2 - Problem Solving	•	•	•	•
3 - Critical Thinking	•	•	•	•
4 - Information Literacy	•	•	•	•
5 - Team Work				
6 - Information Technology Competence	•			•
7 - Cross Cultural Competence				
8 - Ethical practice	•	•	•	•
9 - Social Innovation				
10 - First Nations Knowledges				
11 - Aboriginal and Torres Strait Islander Cultures				

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes										
	1	2	3	4	5	6	7	8	9	10	11
1 - Written Assessment - 15%	•	•	•	•		•		•			
2 - Presentation - 35%	•	•	•	•		•		•			
3 - Portfolio - 50%	•	•	•	•		•		•			

Textbooks and Resources

Textbooks

There are no required textbooks.

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Microsoft word AND excel or equivalent Mac or Open Source packages
- Citation management software such as EndNote or Zotero
- Zoom videoconferencing software. A Zoom account is available with your student credentials

Referencing Style

All submissions for this unit must use the referencing style: Harvard (author-date)
For further information, see the Assessment Tasks.

Teaching Contacts

Andrew Irving Unit Coordinator
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Schedule

Week 1 - 09 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Unit introduction • Planning for assessments • The scientific method	See Moodle for readings and activities	

Week 2 - 16 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Testing hypotheses • Research methods	See Moodle for readings and activities	

Week 3 - 23 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Fundamentals of experimental design	See Moodle for readings and activities	

Week 4 - 30 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Research planning • Writing your research proposal	See Moodle for readings and activities	

Week 5 - 06 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Research integrity, ethics, and risk assessment	See Moodle for readings and activities	Research proposal Due: Week 5 Friday (10 Apr 2026) 11:45 pm AEST

Week 6 - 13 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic

• Talking about your science: Strategies for preparing a 3-minute speech	See Moodle for readings and activities	

Vacation Week - 20 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic

Week 7 - 27 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Getting comfortable with variation • Constructing useful graphs	See Moodle for readings and activities	

Week 8 - 04 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Fundamental probability theory • Basic statistical analysis	See Moodle for readings and activities	

Week 9 - 11 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Writing about your science: Tips for your research report	See Moodle for readings and activities	Research update - Video presentation Due: Week 9 Friday (15 May 2026) 11:45 pm AEST

Week 10 - 18 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Reading journal articles • Evaluating information from the internet	See Moodle for readings and activities	

Week 11 - 25 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Referencing your research report	See Moodle for readings and activities	

Week 12 - 01 Jun 2026

Module/Topic	Chapter	Events and Submissions/Topic
• Finalising your research report	See Moodle for readings and activities	Research project report Due: Week 12 Friday (5 June 2026) 11:45 pm AEST

Exam Week - 08 Jun 2026

Module/Topic	Chapter	Events and Submissions/Topic

Vacation/Exam Week - 15 Jun 2026

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

In addition to the lectures and theory presented in this unit, you are required to conceptualize, plan, conduct, and summarise your own scientific research project. The teaching staff are here to help guide you along your way, providing professional advice and feedback for you to consider. The assessment items are also conceptually linked, such that the feedback you receive from your first assessment should help to inform and improve your second assessment, and likewise for the second to third assessment. Your research project will be done off campus (usually at your place of residence) according to your own schedule, as there is no residential school for this unit. As such, effective time management will be important to complete your project on schedule and submit related assessment pieces of an acceptable
quality. Communication with the teaching staff is a critical part of this process, especially earlier in term when formulating your project design. The unit's Moodle page will be the central resource for advice, updates, and other important information throughout term

Assessment Tasks

1 Research proposal

Assessment Type
Written Assessment

Task Description
Complete a research proposal detailing the research project you will complete during this unit. The research proposal is a document that outlines the reason/justification for your project (often by way of a short background section), presents your aims/objectives, hypotheses, and describes how you're going to do the experiment and collect the data. Examples will be discussed in class, with additional information, resources, and assessment instructions provided on the unit's Moodle site during term. Feedback from this assessment will be helpful for ensuring your practical experimental work is of a high quality. AI may be used as part of your preliminary literature and information search strategy, but must not be used to construct your proposal (i.e. the written proposal must be your own work).
Level of GenAI use allowed: Level 2: You may use AI for planning, idea development, and research. Your final submission should show how you have developed and refined these ideas.

Assessment Due Date
Week 5 Friday (10 Apr 2026) 11:45 pm AEST

Please submit your work as a Word document via Moodle.

Return Date to Students
Vacation Week Friday (24 Apr 2026)

Your marked work with feedback will be returned to you through Moodle.

Weighting
15%

Minimum mark or grade
50%

Assessment Criteria
The proposal you submit for assessment will require you to provide:

- An overview and justification supporting your proposed project
- Aims/objectives and hypotheses of your research
- A description of the planned methodology and experimental design
- Considers ethics and assesses risk
- Template(s) for data collection
- Proposal length: 1000 words (+/- 10 %)
- Minimum of four (4) references (no web pages unless of the data repository type).

Additional details, including the marking structure, will be available on the unit's Moodle site during term.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Please submit your work as a Word document via Moodle.

Learning Outcomes Assessed

- Explain and apply information and numerical literacy skills to communicate scientific knowledge and ideas clearly and coherently to a variety of audiences

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Ethical practice

2 Research update - Video presentation

Assessment Type
Presentation

Task Description
Prepare a three minute video providing an update on the status of your research project. This video presentation should be considered an update that would be provided to key industry stakeholders or funding partners. Typically, such an update includes a brief description/recap of the reason for the project, the aims/objectives/hypothesis, a summary of the methodology, and the presentation of any results or observations to date. Additional information, resources, and assessment instructions will be provided on the unit's Moodle site during term. AI may be used to help search for an identify additional research relevant to your project, but must not be used to script or deliver your presentation.
Level of GenAI use allowed: Level 2: You may use AI for planning, idea development, and research. Your final submission should show how you have developed and refined these ideas.

Assessment Due Date
Week 9 Friday (15 May 2026) 11:45 pm AEST

Please submit your video recording via the Moodle site.

Return Date to Students
Week 11 Friday (29 May 2026)

Marks and feedback for your update video will be provided via the Moodle site.

Weighting
35%

Minimum mark or grade
50%

Assessment Criteria
The three minute video you submit for assessment will require you to provide:

- An explanation to the background on your research.
- Aims/objectives and hypotheses of your research.
- A brief description of your methodology and experimental design.
- An update on the status of the research.
- A brief summary of any results/observations available.
- Minimum of four (4) references (no web pages unless of the data repository type).
- Presenting your update strictly within the time limit specified (3 mins +/- 20 seconds)

Further detail, including the marking structure, will be provided on the Moodle site during term.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Please submit your video recording via the Moodle site.

Learning Outcomes Assessed

- Explain and apply information and numerical literacy skills to communicate scientific knowledge and ideas clearly and coherently to a variety of audiences
- Formulate a research hypothesis and research questions that include relevant ethical considerations
- Conduct and manage a small research project using quantitative, qualitative or mixed methods research methodologies

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Ethical practice

3 Research project report

Assessment Type
Portfolio

Task Description
This final assessment task requires you to complete a written report summarising your research project. Your research report format is to be based on a typical scientific paper or report (to be discussed in lecture), and must include an

introduction/background section (including your hypothesis), a description of the methods used, a results section that describes, presents, and analyses your data, and a summary discussion that describes what the results mean and what contribution to knowledge they make.
Additional information, resources, and assessment instructions will be provided on the unit's Moodle site during term. AI may be used as part of your literature and information search strategy, but must not be used to construct your research report (i.e. the written report must be your own work).
Level of GenAI use allowed: Level 2: You may use AI for planning, idea development, and research. Your final submission should show how you have developed and refined these ideas.

Assessment Due Date
Week 12 Friday (5 June 2026) 11:45 pm AEST

Please submit your report as a Word document through the Moodle page.

Return Date to Students
Vacation/Exam Week Friday (19 June 2026)

Your marked report with feedback will be returned to you through the Moodle page.

Weighting
50%

Minimum mark or grade
50%

Assessment Criteria
The report you submit for assessment will require you to provide:

- A literature review and background description of the rationale for doing the research project, including the hypothesis(es).
- A description of the methodology used.
- An analysis, interpretation and explanation of results obtained.
- A summary discussion of the results obtained, placed in the context of current literature.
- Expectation of 2500 words (+/- 10 %).
- Minimum of eight (8) references (no web pages unless of the data repository type).

Further detail, including the marking structure, will be provided on the unit's Moodle site during term.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Please submit your report as a Word document through the Moodle page.

Learning Outcomes Assessed

- Explain and apply information and numerical literacy skills to communicate scientific knowledge and ideas clearly and coherently to a variety of audiences
- Formulate a research hypothesis and research questions that include relevant ethical considerations
- Conduct and manage a small research project using quantitative, qualitative or mixed methods research methodologies
- Analyse, interpret and explain scientific data, resulting in the production of a research report appropriate for an e-portfolio.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Ethical practice

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the Student Academic Integrity Policy and Procedure. This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the Academic Learning Centre (ALC) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?

Be Honest
If your assessment task is done by someone else, it would be dishonest of you to claim it as your own

Seek Help
If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)

Produce Original Work
Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem