

ENEE12014 *Electrical Circuit Analysis*

Term 1 - 2026

Profile information current as at 21/04/2026 08:57 pm

All details in this unit profile for ENEE12014 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

This unit introduces you to modelling electrical components and systems. You will apply theorems and network reduction techniques to DC and AC circuits, and apply problem-solving techniques in the analysis of AC and DC circuits. You will also cover the concepts of transient response. You will apply laboratory techniques and appropriate software tools to the analysis of electrical circuits, use fundamental electrical engineering language in context and document the process of modelling and analysis. You will present information, communicate, work and learn in a professional manner. In this unit, you must complete compulsory practical activities. Refer to the Engineering Undergraduate Course Moodle site for proposed dates.

Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisites: ENEG11009 Fundamentals of Sustainable Energy and MATH11219 Applied Calculus.

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

- Bundaberg
- Cairns
- Gladstone
- Mackay
- Mixed Mode
- 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. Online Quiz(zes)

Weighting: 15%

2. Online Test

Weighting: 25%

3. Practical and Written Assessment

Weighting: 20%

4. Online Test

Weighting: 40%

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 In Class discussion

Feedback

Students indicated this unit covers good amount of content within this unit

Recommendation

Same content should be maintained.

Feedback from SUTE

Feedback

Students expected timely detailed feedback

Recommendation

Laboratory report submission deadline should be advanced to Week 10 so that detailed timely feedback can be provided by Week 12.

Feedback from SUTE

Feedback

Students expected more useful learning material

Recommendation

New Learning material should be added to the unit content.

Unit Learning Outcomes

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

1. Model electrical components and systems
2. Apply circuit laws to find electric fields, electric potentials, and currents in Direct Current (DC) circuits
3. Apply network reduction techniques to analyse and solve Direct Current (DC) circuit problems
4. Model and analyse the transient behaviour of circuits with resistors, inductors, and capacitors
5. Analyse and solve problems of Alternating Current (AC) circuits
6. Use appropriate software tools to simulate electrical circuits and verify the results by conducting laboratory experiments using safe work practices
7. Work individually and in a team to solve electrical circuit problems and produce professional laboratory documents.

The Learning Outcomes for this unit are linked with the Engineers Australia Stage 1 Competency Standards for Professional Engineers in the areas of 1. Knowledge and Skill Base, 2. Engineering Application Ability and 3. Professional and Personal Attributes at the following levels:

Introductory

1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline. (LO: 1N 2N)

1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline. (LO: 3N)

1.4 Discernment of knowledge development and research directions within the engineering discipline. (LO: 6N)

1.5 Knowledge of engineering design practice and contextual factors impacting the engineering design (LO: 2N)

1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline. (LO: 4N)

Intermediate

1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline. (LO: 2I 3I 4I 5I 6N)

1.3 In depth understanding of specialist bodies of knowledge within the engineering discipline (LO: 2N)

1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline. (LO: 3I 4N 5N)

2.3 Application of systematic engineering synthesis and design processes. (LO: 3I 4N 5N)

3.2 Effective oral and written communication in professional and lay domains. (LO: 6I 7I)

3.6 Effective team membership and team leadership. (LO: 6 7I)

Advanced

2.1 Application of established engineering methods to complex engineering problem solving. (LO: 1I 2A 3I 4I 5I)

2.2 Fluent application of engineering techniques, tools and resources. (LO: 3A 4I 5I 6I)

Note: LO refers to the Learning Outcome number(s) which link to the competency and the levels: N - Introductory, I - Intermediate and A - Advanced.

Refer to the Engineering Undergraduate Course Moodle site for further information on the Engineers Australia's Stage 1 Competency Standard for Professional Engineers and course level mapping information <https://moodle.cqu.edu.au/course/view?id=1511>

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	5	6	7
1 - Online Quiz(zes) - 15%	●	●		●	●		
2 - Online Test - 25%	●	●	●				
3 - Practical and Written Assessment - 20%						●	●
4 - Online Test - 40%			●	●	●		

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
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							

Textbooks and Resources

Textbooks

ENEE12014

Prescribed

Electric Circuits

Edition: 11 (2018)

Authors: James W. Nilsson, Susan A. Riedel

Pearson

Upper Saddle River , NJ , USA

ISBN: 13:9781488657979

Binding: eBook

ENEE12014

Supplementary

COMPKIT_ENEE12014

Edition: 02 (2023)

Authors: CQU-SET

Rockhampton , QLD , Australia

ISBN: NA

Binding: Other

ENEE12014

Supplementary

TAMKIT

Edition: 02 (2023)

Authors: CQU-SET

Rockhampton , QLD , Australia

ISBN: NA

Binding: Other

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Multisim 14.0 Education Edition or later (CQU will provide the licence key to install it on student computers).

Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Shaminda De Silva Unit Coordinator

s.desilva@cqu.edu.au

Schedule

Week 1 - 09 Mar 2026

Module/Topic

Chapter

Events and Submissions/Topic

Introduction to Electrical Circuit Analysis	1-2	
Week 2 - 16 Mar 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Resistance, Sources and Models	3	Lab A Quiz Due: Week 2 Sunday (22 March 2026) 11:45 pm AEST
Week 3 - 23 Mar 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Nodal Analysis	4	Lab B Quiz Due: Week 3 Sunday (29 March 2026) 11:45 pm AEST
Week 4 - 30 Mar 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Mesh Analysis	4	Lab C Quiz Due: Week 4 Sunday (5 April 2026) 11:45 pm AEST
Week 5 - 06 Apr 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Network Theorems	4	Lab D Quiz Due: Week 5 Sunday (12 April 2026) 11:45 pm AEST Progressive Test 1 Due: Week 5 Sunday (12 April 2026) 11:45 pm AEST
Week 6 - 13 Apr 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Transient Analysis I	6	Residential School : Week 6 Monday & Tuesday (13 & 14 April 2026)
Vacation Week - 20 Apr 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Week 7 - 27 Apr 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Transient Analysis II	7	In-Class Test (Online) (covering Week 1 to Week 5 content) Due: During Week 7
Week 8 - 04 May 2026		
Module/Topic	Chapter	Events and Submissions/Topic
RLC circuits	8	
Week 9 - 11 May 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Steady State Sinusoidal Analysis I	9	Progressive Test 2 Due: Week 9 Sunday (17 May 2026) 11:45 pm AEST

Week 10 - 18 May 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Steady State Sinusoidal Analysis II	9	
Week 11 - 25 May 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Sinusoidal Steady State Power calculations	10	Laboratory Exercises and Report Due: Week 11 Monday (25 May 2026) 8:00 am AEST
Week 12 - 01 Jun 2026		
Module/Topic	Chapter	Events and Submissions/Topic
Exam Revision		Progressive Test 3 Due: Week 12 Sunday (7 June 2026) 11:45 pm AEST
Exam Week - 08 Jun 2026		
Module/Topic	Chapter	Events and Submissions/Topic
		Online Test will be scheduled in Exam Week. Date and Time will be notified closer to the Online Test date.
Vacation/Exam Week - 15 Jun 2026		
Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 PROGRESSIVE TESTS

Assessment Type

Online Quiz(zes)

Task Description

This assessment item is a set of online quizzes that can be accessed via the unit Moodle site.

- Progressive Tests (Online quizzes) are an integral part of the study to test the key concepts of each week.
- Details of the assessment can be found on the unit Moodle site at the beginning of the term.
- Each Progressive Test will be available for up to 2 weeks to allow students who cannot find time each week to study. For example, Progressive Test 1 will open in Week 3 and close at the end of week 5, Progressive Test 2 will open in Week 7 and close at the end of Week 9 and the Progressive Test 3 will open in Week 10 and close at the end of Week 12.
- Each Progressive Test can be attempted several times. Progressive Test questions are marked automatically; first attempt only counts. The correct answers for Progressive Test questions will be available immediately after you submit your answers.
- If you encounter any network access issues during the Progressive Test, the unit coordinator should be notified at your earliest convenience.

Guidelines on AI Tool Usage

AI Assessment Scale: No AI

This assessment must be completed without the use of AI tools such as ChatGPT, Copilot, or other generative technologies, even if completed outside a controlled environment.

Please ensure your submission reflects your own understanding and problem-solving process.

This assessment is exempted from the 72-hour submission grace period and must be completed by the stated submission date/time.

Number of Quizzes

3

Frequency of Quizzes

Other

Assessment Due Date

Progressive Test 1 due on 12th April at 11:45 pm AEST; Progressive Test 2 due on 17th May at 11:45 pm AEST and Progressive Test 3 due on 7th June 2026 at 11:45 pm AEST

Return Date to Students

Immediate Feedback

Weighting

15%

Minimum mark or grade

You must achieve $\geq 25\%$ cumulative marks across Progressive Tests

Assessment Criteria

Auto-marked

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Learning Outcomes Assessed

- Model electrical components and systems
- Apply circuit laws to find electric fields, electric potentials, and currents in Direct Current (DC) circuits
- Model and analyse the transient behaviour of circuits with resistors, inductors, and capacitors
- Analyse and solve problems of Alternating Current (AC) circuits

2 In-Class Test

Assessment Type

Online Test

Task Description

This assessment covers weekly topics from Week 1 to Week 5. Students are required to answer analytical and numerical questions to demonstrate their theoretical and analytical problem solving skills. Further information about this time-bounded In-Class Test (Online) will be provided in the unit Moodle site.

Submission file name must follow this naming convention: Student Name_ENEE12014_In Class Test (e.g., Greg Smith_ENEE12014_In Class Test).

Guidelines on AI Tool Usage

AI Assessment Scale: No AI

This assessment must be completed without the use of AI tools such as ChatGPT, Copilot, or other generative technologies, even if completed outside a controlled environment. However, students may use basic grammar and spelling aids (e.g., Grammarly) to refine written expression, provided these tools do not assist with solving the numerical problems or generating content.

Please ensure your submission reflects your own understanding and problem-solving process.

This assessment is exempted from the 72-hour submission grace period and must be completed by the stated submission date/time.

Assessment Due Date

Due during Week 7

Return Date to Students

We strive to release the assessment marks in 2 weeks after due date

Weighting

25%

Minimum mark or grade

You must achieve $\geq 25\%$ of the allocated marks of this assessment.

Assessment Criteria

1. Application of theoretical fundamentals.
2. Utilisation of correct theory/method to analyse problems.
3. Produce correct circuit diagrams/schematics using standard electrical engineering symbols.
4. Use of appropriate mathematical tools and deriving correct answers.
5. All workings and intermediate steps must be shown with justification where necessary.
6. Partial marks are awarded for applying correct methods and showing appropriate workings even final answers are

incorrect.

7. Correct interpretation and discussion of results/answers

8. Workings must be neat, tidy and legible.

9. On-time submission

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Submission Instructions

Submit as a single PDF file via the unit Moodle site

Learning Outcomes Assessed

- Model electrical components and systems
- Apply circuit laws to find electric fields, electric potentials, and currents in Direct Current (DC) circuits
- Apply network reduction techniques to analyse and solve Direct Current (DC) circuit problems

3 Laboratory Exercises and Report

Assessment Type

Practical and Written Assessment

Task Description

This assessment item relates to all the unit topics.

- All information regarding the laboratories will be provided to the students via the unit Moodle site.
- This assessment item is related to laboratory exercises A, B, C and D.
- All students must complete Laboratory Quiz A, B, C and D on or before the due date.
- Attendance to laboratories exercises are compulsory for all On-campus students to Pass this unit.
- Online (Distance and Mixed mode) students are provided with alternative solutions to complete the laboratory exercises.
- All students are expected to successfully complete Lab A Quiz, Lab B Quiz, Lab C Quiz and Lab D Quiz.
- Students need to submit an individual Laboratory Exercises based report for this assessment by the due date regardless of whether students complete laboratory exercises in teams or individually.
- Laboratory Exercise based Report file name must follow this naming convention: Student Name_ENEE12014_Lab Report (e.g., Greg Smith_ENEE12014_Lab Report).
- All students must pass the Laboratory Exercises based assessments to obtain an overall pass for this unit.

Guidelines on AI Tool Usage

AI Assessment Scale: No AI

This assessment must be completed without the use of AI tools such as ChatGPT, Copilot, or other generative technologies, even if completed outside a controlled environment. However, students may use basic grammar and spelling aids (e.g., Grammarly) to refine written expression, provided these tools do not assist with solving the numerical problems or generating content.

Please ensure your submission reflects your own understanding and problem-solving process.

This assessment is exempted from the 72-hour submission grace period and must be completed by the stated submission date/time.

Assessment Due Date

Week 11 Monday (25 May 2026) 8:00 am AEST

Laboratory Quizzes (A, B, C, D) are due on 23rd March, 30th March, 6th April, 13th April respectively. Laboratory Exercise based Report on Monday 25th May at 8:00 am AEST.

Return Date to Students

Exam Week Monday (8 June 2026)

We strive to release the assessment marks in 2 weeks after due date

Weighting

20%

Minimum mark or grade

Combined laboratory exercise report and Lab Quizzes marks need to be more than 50%

Assessment Criteria

- Completion of Laboratory Quizzes

- The laboratory reports will be graded using the following criteria:

- Correct description of laboratory concepts and procedures;
- Use of correct measurements, and units;
- Demonstration of correct workings, calculations, solutions, analysis and logical thinking;
- Where appropriate show the calculated values based on theory and compare them against the measured values;
- Appropriate discussion and understanding of laboratory results;
- Photographic and other evidence that correct measurements/results were obtained by the team (or by an individual) where necessary;
- Individual reports must be professional and typed, including references;
- Proper formatting and structuring of reports
- Have neat, tidy work and excellent presentations of laboratory work.
- All laboratory exercises must be attempted.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Submission Instructions

Submit as a single PDF file via the unit Moodle site

Learning Outcomes Assessed

- Use appropriate software tools to simulate electrical circuits and verify the results by conducting laboratory experiments using safe work practices
- Work individually and in a team to solve electrical circuit problems and produce professional laboratory documents.

4 Online Test

Assessment Type

Online Test

Task Description

This online test may cover all topics from weeks 6 to 12 and may consist of a mix 3-6 numerical as well as descriptive answer questions.

This online test will be held during the University exam period (Week 13 or 14). The exact date and time will be confirmed by the end of week 11. This online test has a duration of 3 hours. You will be provided with an additional 30 minutes to read the paper, scan and upload the answer scripts. The Moodle submission link becomes inactive after 3.5 hours. You are encouraged to sit the test from a location with a good Internet connection and where you have access to a scanner. If you are unable to find a scanner, you can use your mobile phone to scan your workings. However, you are expected to collate them and upload as a single PDF file through the unit Moodle site. End of Term Online Test workings/answers file name must follow this naming convention: Student Name_ENEE12014_Final Online Test Answers (e.g., Greg Smith_ENEE12014_Final Online Test Answers).

Guidelines on AI Tool Usage

AI Assessment Scale: No AI

This assessment must be completed without the use of AI tools such as ChatGPT, Copilot, or other generative technologies, even if completed outside a controlled environment. However, students may use basic grammar and spelling aids (e.g., Grammarly) to refine written expression, provided these tools do not assist with solving the numerical problems or generating content.

Please ensure your submission reflects your own understanding and problem-solving process.

This assessment is exempted from the 72-hour submission grace period and must be completed by the stated submission date/time.

Assessment Due Date

Due during Exam Week.

Return Date to Students

CQUni does not require that marked End of Term Online Test papers be made available to students. Grades will only be available after the confirmation of grades.

Weighting

40%

Minimum mark or grade

You must achieve $\geq 50\%$ of the allocated marks of this assessment.

Assessment Criteria

1. Application of theoretical fundamentals.
2. Utilisation of correct theory/method to analyse problems.
3. Drawing correct circuit diagrams/schematics using standard electrical engineering symbols.
4. Use of appropriate mathematical tools and deriving correct answers.
5. All workings and intermediate steps must be shown with justification where necessary.
6. Workings must be neat, tidy and legible.
7. Partial marks are awarded for applying correct methods and showing appropriate workings even final answers are incorrect.
8. Correct interpretation and discussion of results/answers
9. On-time submission

Referencing Style

- Harvard (author-date)

Submission

Online

Submission Instructions

Submit as a single PDF file via the unit Moodle site.

Learning Outcomes Assessed

- Apply network reduction techniques to analyse and solve Direct Current (DC) circuit problems
- Model and analyse the transient behaviour of circuits with resistors, inductors, and capacitors
- Analyse and solve problems of Alternating Current (AC) circuits

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