



# **ENEE12014 *Electrical Circuit Analysis***

## **Term 1 - 2020**

Profile information current as at 08/05/2024 07:47 am

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.

### **Corrections**

#### **Unit Profile Correction added on 24-04-20**

1. Residential school and On-Campus laboratory sessions are called off: Lab kits will be posted to students so that they can do the laboratory exercises at home.
2. Students will submit only one laboratory report instead of two as previously outlined.
3. In-class test planned to carry out during residential school period will be conducted as a Moodle On-line Quiz so that students do not required to physically present in campus to sit for In-Class test.
4. End of term final examination will be replaced by a take home time bounded Assignment. (ie: students need to complete Assignment with in few days.)

## 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 and two-port network theorems. 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. Online students must complete practical activities by attending a compulsory residential school.

### 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: (PHYS11185 Engineering Physics B OR ENEG11009 Fundamentals of Energy and Electricity) 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 - 2020

- 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).

### Residential Schools

This unit has a Compulsory Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

### 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(es)**

Weighting: 15%

#### 2. **In-class Test(s)**

Weighting: 25%

#### 3. **Practical and Written Assessment**

Weighting: 10%

#### 4. **Practical and Written Assessment**

Weighting: 10%

#### 5. **Examination**

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 Student evaluation

##### **Feedback**

Tutorial problems were helpful to improve the understanding of theoretical concepts taught in the lecture.

##### **Recommendation**

Continue with the same tutorials.

#### Feedback from Student evaluation and email

##### **Feedback**

Assessments were returned quickly.

##### **Recommendation**

Maintain the same practice.

#### Feedback from Student evaluation

##### **Feedback**

Laboratory exercises helped to better understand the fundamental concepts.

##### **Recommendation**

Continue with the same lab exercises.

#### Feedback from Student evaluation

##### **Feedback**

Assignment questions were harder than lecture examples.

##### **Recommendation**

Include few straight forward question in Assignments.

## Unit Learning Outcomes

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

1. Model electrical components and systems
2. Analyse and solve problems of Direct Current (DC) circuits using network reduction techniques
3. Model and analyse the transient behaviour of circuits with resistors, inductors, and capacitors
4. Analyse and solve problems of Alternating Current (AC) circuits
5. Model and solve electrical circuit problems using two-port circuit model theorems
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 Engineers Australia's **Stage 1 Competency Standard for Professional Engineers**.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Online Quiz(zes) - 15%	•	•		•	•		
2 - In-class Test(s) - 25%	•	•	•				
3 - Practical and Written Assessment - 10%						•	•
4 - Practical and Written Assessment - 10%						•	•
5 - Examination - 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 - 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
1 - Online Quiz(zes) - 15%		•	•							
2 - In-class Test(s) - 25%		•	•							
3 - Practical and Written Assessment - 10%	•	•	•			•				
4 - Practical and Written Assessment - 10%	•	•	•			•				

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
<b>5 - Examination - 40%</b>										

## Textbooks and Resources

### Textbooks

ENEE12014

#### Prescribed

#### Electric Circuits

Global Edition 11 (2018)

Authors: James W. Nilsson, Susan A. Riedel

Pearson

Upper Saddle River , NJ , USA

ISBN: 9781292261041

Binding: Other

#### Additional Textbook Information

An electronic version of this text book is also available from the publisher here:

<https://www.pearson.com.au/9781292261065>

However, paper copies can be still purchased from the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

**You will need access to the following IT resources:**

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

## 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](mailto:s.desilva@cqu.edu.au)

## Schedule

### Week 1 - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Resistance, Sources and Models	1-3	

### Week 2 - 16 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Nodal Analysis	4	

**Week 3 - 23 Mar 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Mesh Analysis	4	Lab 1 Quiz

**Week 4 - 30 Mar 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Network Theorems	4	Quiz 1 Due on Sunday 11:45 pm AEST

**Week 5 - 06 Apr 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Transient Analysis I	6	Lab 2 Quiz

**Vacation Week - 13 Apr 2020**

Module/Topic	Chapter	Events and Submissions/Topic
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**Week 6 - 20 Apr 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Transient Analysis II	7	

**Week 7 - 27 Apr 2020**

Module/Topic	Chapter	Events and Submissions/Topic
		Residential school in Rockhampton from 27 to 29 April, 2020
RLC circuits	8	In-Class test during this week
		Quiz 2 Due on Sunday 11:45 pm AEST

**Week 8 - 04 May 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Steady State Sinusoidal Analysis I	9	Lab Quiz 3

**Week 9 - 11 May 2020**

Module/Topic	Chapter	Events and Submissions/Topic
		Lab Quiz 4
		Quiz 3 Due on Sunday 11:45 pm AEST
Steady State Sinusoidal Analysis II	9	
		<b>Laboratory Exercises and Reports Part I</b> Due: Week 9 Friday (15 May 2020) 11:45 pm AEST

**Week 10 - 18 May 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Sinusoidal Steady State Power calculations	10	

**Week 11 - 25 May 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Two port networks	18	<b>Laboratory Exercises and Reports Part II</b> Due: Week 11 Friday (29 May 2020) 11:45 pm AEST

**Week 12 - 01 Jun 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Exam Revision		

**Review/Exam Week - 08 Jun 2020**

Module/Topic	Chapter	Events and Submissions/Topic
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## Assessment Tasks

### 1 Progressive Tests

**Assessment Type**

Online Quiz(zes)

**Task Description**

This assessment item is a set of online quizzes which can be accessed via the unit Moodle site. The quizzes are an integrated part of the study to test on 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 quiz will be available up to 2 weeks to allow students who cannot find time each week for study. For example quiz one will open in Week 2 and close at the end of week 4, and last quiz must be completed by week 9.

Each quiz can be attempted several times, but the score for the quiz will be the score for your first attempt. Correct answer for the quiz questions will be available immediately after you submit your answers.

If you encounter any network access issues during the quiz, the unit coordinator should be notified at your earliest convenient.

**Number of Quizzes**

3

**Frequency of Quizzes**

Fortnightly

**Assessment Due Date**
**Return Date to Students**

Immediate Feedback

**Weighting**

15%

**Assessment Criteria**

No assessment criteria

**Referencing Style**

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

**Submission**

Online

**Learning Outcomes Assessed**

- Model electrical components and systems
- Analyse and solve problems of Direct Current (DC) circuits using network reduction techniques
- Analyse and solve problems of Alternating Current (AC) circuits
- Model and solve electrical circuit problems using two-port circuit model theorems

**Graduate Attributes**

- Problem Solving
- Critical Thinking

### 2 In-Class Test

**Assessment Type**

In-class Test(s)

**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 knowledge and analytical problem solving skills.

Mixed mode students will sit this in-class test during Residential school in Rockhampton. If any mixed-mode student unable to attend the residential school may suggested to withdraw from the unit before census date.



Further information about In-class test will be provided in the unit Moodle site.

**Assessment Due Date****Return Date to Students**

Two weeks after the In-Class test

**Weighting**

25%

**Minimum mark or grade**

25% of allocated marks for this assessment

**Assessment Criteria**

No Assessment Criteria

**Referencing Style**

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

**Submission**

Offline

**Learning Outcomes Assessed**

- Model electrical components and systems
- Analyse and solve problems of Direct Current (DC) circuits using network reduction techniques
- Model and analyse the transient behaviour of circuits with resistors, inductors, and capacitors

**Graduate Attributes**

- Problem Solving
- Critical Thinking

### 3 Laboratory Exercises and Reports Part I

**Assessment Type**

Practical and Written Assessment

**Task Description**

This assessment item relates to 1 to 4 of the unit topics.

Laboratories will be held at various times, as directed by the unit website, through the semester or in the case of mixed mode students at the residential school. All information regarding the laboratories will be provided to the students via the unit website. Laboratories are compulsory and all students must pass the laboratory techniques assessments to obtain an overall pass for this unit.

Students need to answer set of **online quizzes** to complete this assessment task.

Students need to submit **individual lab report** (not one report per lab group) for assessment by the due date.

**Assessment Due Date**

Week 9 Friday (15 May 2020) 11:45 pm AEST

**Return Date to Students**

Week 11 Friday (29 May 2020)

Two Weeks after submission

**Weighting**

10%

**Minimum mark or grade**

PASS (Combined laboratory report part I and II marks need to be more than 50% to Pass this unit)

**Assessment Criteria**

The lab reports will be graded using the following criteria:

Proper formatting and structuring of reports

Correct workings and solutions;

Where appropriate show the calculated values based on theory and compare them against the measured values;

Appropriate discussion of laboratory results;

Proper use of references;

Have neat and tidy work and presentation in the lab book;

All laboratory exercises must be attempted.

Combined laboratory part 1 and 2 marks need to be more than 50% to Pass.

## Referencing Style

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

## Submission

Online

## Submission Instructions

As a single PDF document

## 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.

## Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Technology Competence

# 4 Laboratory Exercises and Reports Part II

## Assessment Type

Practical and Written Assessment

## Task Description

This assessment item relates to all the unit topics.

Laboratories will be held at various times, as directed by the unit website, through the semester or in the case of mixed mode students at the residential school. All information regarding the laboratories will be provided to the students via the unit website. Laboratories are compulsory and all students must pass the laboratory techniques assessments to obtain an overall pass for this unit.

Students need to answer set of **online quizzes** to complete this assessment task.

Students need to submit **individual lab report** (not one report per lab group) for assessment by the due date

## Assessment Due Date

Week 11 Friday (29 May 2020) 11:45 pm AEST

## Return Date to Students

Review/Exam Week Friday (12 June 2020)

Two weeks after submission

## Weighting

10%

## Minimum mark or grade

PASS (Combined laboratory report part I and II marks need to be more than 50% to Pass this unit)

## Assessment Criteria

The lab reports will be graded using the following criteria:

Proper formatting and structuring of reports

Correct workings and solutions;

Where appropriate show the calculated values based on theory and compare them against the measured values;

Appropriate discussion of laboratory results;

Proper use of references;

Have neat and tidy work and presentation in the lab work.

All laboratory exercises must be attempted.

Combined laboratory part 1 and 2 marks need to be more than 50% to Pass

## Referencing Style

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

## Submission

Online

## Submission Instructions

As a single PDF document

### **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.

### **Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Technology Competence

## **Examination**

### **Outline**

Complete an invigilated examination.

### **Date**

During the examination period at a CQUniversity examination centre.

### **Weighting**

40%

### **Length**

180 minutes

### **Minimum mark or grade**

50% of the allocated marks of this assessment

### **Exam Conditions**

Restricted.

### **Materials**

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

Calculator - all non-communicable calculators, including scientific, programmable and graphics calculators are authorised

## 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