ENAE12013 *Electrical Components and Circuit Analysis*
Term 2 - 2017

Profile information current as at 12/10/2024 05:07 pm

All details in this unit profile for ENAE12013 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 the modelling electrical components and systems. Students apply theorems and network reduction techniques to DC and AC circuits, and apply problem solving techniques in the analysis of AC and DC circuits. The unit also covers the concepts of transient response, Laplace transforms and tranasfer functions. Students also apply laboratory techniques and appropriate software tools to the analysis of electrical circuits. Students use fundamental electrical engineering language in context and document the process of modelling and analysis. They present information, communicate, work and learn in a professional manner. Distance students must complete practical activities outcomes by attending 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
Prereq: (ENAG11002 Energy & Electricity or ENEG11009 Fundamentals of Energy & Electricity) and MATH11160 Technology Mathematics
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 2 - 2017

- Distance

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: 20%
2. **Written Assessment**
Weighting: 30%
3. **Written Assessment**
Weighting: 30%
4. **Practical and Written Assessment**
Weighting: 20%
5. **Online Quiz(zes)**
Weighting: Pass/Fail

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 Course evaluation

Feedback

Students highly appreciated the residential school laboratory activities, support provided and more importantly lecturer - student face to face interaction to further the understanding of course material.

Recommendation

Conduct similar or improved Res school.

Feedback from Course evaluation, Email

Feedback

Students appreciated the support provided such as time taken to answer questions and timely feedback given to marked assessments.

Recommendation

Continue to provide similar or improved support.

Feedback from Course evaluation, Email

Feedback

Couple of more worked examples on s domain analysis and Laplace transform would've been helpful.

Recommendation

More tutorial questions will be added from last two topics.

Feedback from Course evaluation, Email

Feedback

Students preferred to submit Assessment items at the end of Weekend.

Recommendation

Assessment due dates will be moved to Sunday, midnight.

Unit Learning Outcomes

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

1. Describe electrical components and their representation by mathematical models
2. Apply theorems and network reduction techniques to analysis of DC and AC circuits
3. Apply the concepts of energy and power and apply power transfer theorems to DC circuits.
4. Model and analyse transient behaviour of circuits with resisters, inductors and capacitors
5. Evaluate circuits using appropriate laboratory instruments
6. Work collaboratively and autonomously to solve problems and communicate clearly and professionally using electrical circuit terminology, symbols and diagrams that conform to Australian Standards

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

— 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
1 - Written Assessment - 20%	•	•				•
2 - Written Assessment - 30%	•	•	•			•
3 - Written Assessment - 30%	•	•	•	•		•
4 - Practical and Written Assessment - 20%	•	•	•	•	•	•
5 - Online Quiz(zes) - 0%	•	•	•	•		•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
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 - Written Assessment - 20%	•	•	•	•		•				
2 - Written Assessment - 30%	•	•	•	•		•				
3 - Written Assessment - 30%	•	•	•	•		•				
4 - Practical and Written Assessment - 20%	•	•	•	•	•	•				

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
5 - Online Quiz(zes) - 0%	•	•	•	•		•				

Textbooks and Resources

Textbooks

ENAE12013

Prescribed

Introductory Circuit Analysis
Edition: 13th edn(Global) (2016)
Authors: Boylestad, RL
Pearson Education
Upper Saddle River , NJ , USA
ISBN: 9781292098951
Binding: Paperback

Additional Textbook Information
Note: The downloadable eBook is available as an online purchase via this link:
http://www.pearson.com.au/9781292098968
The prescribed version of NI Multisim is the latest (Ver. 14.0) . Please see the Moodle site for further details.

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

Schedule

Week 1 - 10 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Electrical Components and Modelling their Electrical Characteristics	1-7	

Week 2 - 17 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic

Nodal Analysis	8	Progressive Test 1: Due Sunday 11:45 PM

Week 3 - 24 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Mesh Analysis	8	

Week 4 - 31 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Network Theorems	9	Progressive Test 2: Due Sunday 11:45 PM

Week 5 - 07 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Capacitors and Inductors	10-12	**Assignment 1** Due: Week 5 Monday (7 Aug 2017) 6:00 am AEST

Vacation Week - 14 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 21 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Transient Behaviour of Electrical Components	10-12	Progressive Test 3: Due Sunday 11:45 PM

Week 7 - 28 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Complex Numbers and Phasors	13-14	Residential School 28 - 30, August

Week 8 - 04 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Steady State Sinusoidal Analysis I	15-17	Progressive Test 4: Due Sunday 11:45 PM

Week 9 - 11 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Steady State Sinusoidal Analysis II	17-19	**Assignment 2** Due: Week 9 Monday (11 Sept 2017) 6:00 am AEST

Week 10 - 18 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Power in AC circuits	20	

Week 11 - 25 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Laplace Transforms	Unit Resource Online	**Laboratory Activities and Report** Due: Week 11 Monday (25 Sept 2017) 6:00 am AEST

Week 12 - 02 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
Circuit Analysis in s Domain	Unit Resource Online	

Review/Exam Week - 09 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
Review	All	**Assignment 3** Due: Review/Exam Week Monday (9 Oct 2017) 6:00 am AEST

Exam Week - 16 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Assignment 1

Assessment Type
Written Assessment

Task Description
This assessment item relates to topics 1-3.
The assignment questions will be released on the unit website at the beginning of the term.
This Assignment is an Individual assessment. Handwritten scanned calculations and formulas will be accepted. You can also use an editable electronic format such as word with equation editor (or MathType) for submission.

Assessment Due Date
Week 5 Monday (7 Aug 2017) 6:00 am AEST

Return Date to Students

Within 2 weeks after due date

Weighting
20%

Assessment Criteria
The assignments will be graded using the following criteria:

- Correct Answers and methods;
- Correct format;
- All working must be shown clearly;
- Assignments must be neat, tidy and legible;
- Attempt all questions.

Referencing Style

- Harvard (author-date)

Submission
Online

assessmentOutcome

- Describe electrical components and their representation by mathematical models
- Apply theorems and network reduction techniques to analysis of DC and AC circuits
- Work collaboratively and autonomously to solve problems and communicate clearly and professionally using electrical circuit terminology, symbols and diagrams that conform to Australian Standards

assessmentGradAttribute

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

2 Assignment 2

Assessment Type
Written Assessment

Task Description
This assessment item relates to topics 4-7.
The assignment questions will be released on the unit website at the beginning of the term.
This Assignment is an Individual assessment. Handwritten scanned calculations and formulas will be accepted. You can

also use an editable electronic format such as word with equation editor (or MathType) for submission.

Assessment Due Date
Week 9 Monday (11 Sept 2017) 6:00 am AEST

Return Date to Students

Within 2 weeks after due date

Weighting
30%

Assessment Criteria
The assignments will be graded using the following criteria:

- Correct Answers and methods;
- Correct format;
- All working must be shown clearly;
- Assignments must be neat, tidy and legible;
- Attempt all questions.

Referencing Style

- Harvard (author-date)

Submission
Online

assessmentOutcome

- Describe electrical components and their representation by mathematical models
- Apply theorems and network reduction techniques to analysis of DC and AC circuits
- Apply the concepts of energy and power and apply power transfer theorems to DC circuits.
- Work collaboratively and autonomously to solve problems and communicate clearly and professionally using electrical circuit terminology, symbols and diagrams that conform to Australian Standards

assessmentGradAttribute

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

3 Assignment 3

Assessment Type
Written Assessment

Task Description
This assessment item relates to topics 8-12.
The assignment questions will be released on the unit website at the beginning of the term.
This Assignment is an Individual assessment. Handwritten scanned calculations and formulas will be accepted. You can also use an editable electronic format such as word with equation editor (or MathType) for submission.

Assessment Due Date
Review/Exam Week Monday (9 Oct 2017) 6:00 am AEST

Return Date to Students

Within 2 weeks after due date

Weighting
30%

Assessment Criteria
The assignments will be graded using the following criteria:

- Correct Answers and methods;
- Correct format;
- All working must be shown clearly;

- Assignments must be neat, tidy and legible;
- Attempt all questions.

Referencing Style

- Harvard (author-date)

Submission
Online

assessmentOutcome

- Describe electrical components and their representation by mathematical models
- Apply theorems and network reduction techniques to analysis of DC and AC circuits
- Apply the concepts of energy and power and apply power transfer theorems to DC circuits.
- Model and analyse transient behaviour of circuits with resisters, inductors and capacitors
- Work collaboratively and autonomously to solve problems and communicate clearly and professionally using electrical circuit terminology, symbols and diagrams that conform to Australian Standards

assessmentGradAttribute

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

4 Laboratory Activities and Report

Assessment Type
Practical and Written Assessment

Task Description
Laboratories will be held 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 **submit individual laboratory reports** (not one report per lab group) for assessment by the due date.

Assessment Due Date
Week 11 Monday (25 Sept 2017) 6:00 am AEST

Return Date to Students

Two weeks after submission

Weighting
20%

Minimum mark or grade
50

Assessment Criteria
The lab reports will be graded using the following criteria:

- Correct workings and solutions;
- Where appropriate show the calculated values based on theory and compare them against the measured values;
- Appropriate discussion of lab results;
- Proper use of references;
- Have neat and tidy handwriting and presentation in the lab book;
- All laboratory exercises must be attempted.

Referencing Style

- Harvard (author-date)

Submission
Online

assessmentOutcome

- Describe electrical components and their representation by mathematical models
- Apply theorems and network reduction techniques to analysis of DC and AC circuits
- Apply the concepts of energy and power and apply power transfer theorems to DC circuits.
- Model and analyse transient behaviour of circuits with resisters, inductors and capacitors
- Evaluate circuits using appropriate laboratory instruments
- Work collaboratively and autonomously to solve problems and communicate clearly and professionally using electrical circuit terminology, symbols and diagrams that conform to Australian Standards

assessmentGradAttribute

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence

5 Online Progressive Tests

Assessment Type
Online Quiz(zes)

Task Description
The assessment is a set of online fortnightly Progressive Tests which can be accessed via the unit Moodle site. The progressive tests 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 progressive test will be available up to 2 weeks after the relevant week to allow students who cannot find time each week for study. For example progressive test one will close at the end of week 2 and progressive test 2 will close at the end of 4. All progressive tests must be completed by the end of week 8.
Each progressive test can be attempted several times, but the score for the progressive test will be the score for your first attempt. Correct answer for the 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 convenient.

Number of Quizzes
4

Frequency of Quizzes
Fortnightly

Assessment Due Date

Throughout the term

Return Date to Students

Immediate feedback

Weighting
Pass/Fail

Minimum mark or grade
PASS

Assessment Criteria
Students need to satisfactorily complete at least 50% of the progressive test questions to pass for this unit.

Referencing Style

- Harvard (author-date)

Submission
Online

assessmentOutcome

- Describe electrical components and their representation by mathematical models
- Apply theorems and network reduction techniques to analysis of DC and AC circuits

- Apply the concepts of energy and power and apply power transfer theorems to DC circuits.
- Model and analyse transient behaviour of circuits with resisters, inductors and capacitors
- Work collaboratively and autonomously to solve problems and communicate clearly and professionally using electrical circuit terminology, symbols and diagrams that conform to Australian Standards

assessmentGradAttribute

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

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