



ENEG11009 *Fundamentals of Energy and Electricity*

Term 2 - 2019

Profile information current as at 03/05/2024 09:01 am

All details in this unit profile for ENEG11009 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 learn how to apply fundamental laws of physics related to energy and electricity using authentic engineering problems. You will be introduced to the concepts of heat, energy, work, energy conversion and laws of thermodynamics. You will apply energy principles of rotational motion, simple harmonic motion and oscillations. You will learn the concepts of voltage and current and use Kirchhoff's laws to analyse simple direct current (DC) and alternating current (AC) electrical circuits. You will also learn the operation of electrical machines such as motors and generators and how to select a machine for a given application. Throughout this unit you will be using experimental and measurement techniques to investigate relevant physical phenomena and learn how they can be used in practice to solve engineering problems. This unit will also provide you with opportunities to develop communication skills through collaborative team work and opportunities to create professional documentation through laboratory reports. Mixed mode students are required to attend the compulsory Residential School.

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 2 - 2019

- 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(zes)**

Weighting: 10%

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

Weighting: 25%

3. **Practical and Written Assessment**

Weighting: 12%

4. **Practical and Written Assessment**

Weighting: 13%

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 Unit evaluation

Feedback

Students have appreciated independent self learning, online quizzes, laboratories, laboratory videos, laboratory guides in this unit and great delivery of the teaching team.

Recommendation

The good practices will be continued.

Feedback from Unit evaluation

Feedback

Some tutorial questions need to be revised, it is better the tutorial questions focus on practicing the lecture materials rather than focusing on covering extra information, e.g., converting imperial units to international standard units.

Recommendation

The tutorial questions will be revised to fit more with the content of the lecture materials.

Feedback from Unit evaluation and teaching team

Feedback

The lab guides and reports need improvement. The measurement error discussion and heat loss calculation is not clear enough to students.

Recommendation

The lab documents will be revised in order to be more understandable and more clear to students.

Feedback from Unit evaluation

Feedback

Students have appreciated the physical workings in the lectures to deliver the contents of the unit more efficiently rather than just using slides.

Recommendation

The good practice will be continued.

Feedback from Teaching team

Feedback

Hard copy of the textbook wasn't available for Term 2, 2018. The hard copy price is also not reasonable for Term 2, 2019.

Recommendation

As the text book is a custom title further discussion by the bookshop team with the publisher is recommended. It is recommended to consider other ways of providing students with the material they require through library subscriptions.

Feedback from Teaching team

Feedback

Broad pass rate low at 60%.

Recommendation

It is recommended that the final exam workload for students of this unit is reduced by introducing a midterm exam. To reduce the workload, the unit content being covered in the midterm exam will not be included in the final exam.

Unit Learning Outcomes

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

1. Solve well defined engineering problems in work, energy and heat transfer
2. Apply physical and circuit laws to find electric fields, electric potentials and currents in Direct Current (DC) circuits
3. Calculate simple capacitor and inductor dimensions and transient behaviour of Resistor-Capacitor (RC) and Resistor-Inductor (RL) circuits
4. Analyse simple Alternating Current (AC) circuits
5. Solve problems related to rotational motion, and electrical machines
6. Conduct scientific experiments to investigate physical phenomena using safe work practices
7. Work individually and collaboratively in a team to produce professional laboratory documentation including error analyses.

Learning outcomes are linked to Engineers Australia Stage 1 Competencies and also discipline capabilities. You can find the mapping for this on the [Engineering Undergraduate Course website](#).

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 - In-class Test(s) - 25%	•	•					
2 - Practical and Written Assessment - 12%						•	•
3 - Online Quiz(zes) - 10%	•	•	•	•	•		
4 - Practical and Written Assessment - 13%						•	•
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						•	•

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
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 - In-class Test(s) - 25%	•	•	•	•		•				
2 - Practical and Written Assessment - 12%	•	•	•		•	•		•		
3 - Online Quiz(zes) - 10%		•	•			•				
4 - Practical and Written Assessment - 13%	•	•	•		•	•		•		
5 - Examination - 40%	•	•	•							

Textbooks and Resources

Textbooks

ENEG11009

Prescribed

Fundamentals of Energy and Electricity

1st Edition (2016)

Authors: R. Knight

Pearson Education Australia

ISBN: 9781488616006

Binding: Paperback

Additional Textbook Information

This is a custom design eBook especially for this unit. This textbook include material from the following 3 Physics text books: "College Physics: A Strategic Approach" by Knight, Jones and Field, "Physics: Principles with Applications", by Giancoli, and "Principals and Practices of Physics" by Mazur. This book is only available in eBook format and you need to purchase this directly through Pearson Education online. More information about purchasing the book will be available in the unit Moodle site.

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

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Schedule

Exam Week - 18 Feb 2019

Module/Topic	Chapter	Events and Submissions/Topic
Week 1 - 15 Jul 2019		
Module/Topic	Chapter	Events and Submissions/Topic
Work, Energy and Power	Part 1 - Chapter 10 & 11	
Week 2 - 22 Jul 2019		
Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Thermodynamics	Part 1 - Chapter 11 Part 2 - Chapter 13, 14 & 15	Online Quiz 1 opens Monday 6:00 am AEST
Week 3 - 29 Jul 2019		
Module/Topic	Chapter	Events and Submissions/Topic

Thermal Properties of Matter	Part 1 - Chapter 11 Part 2 - Chapter 13, 14 & 15	Online Quiz 1 Due Week 3 Sunday 11:45 pm AEST
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Week 4 - 05 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Electric Charges and Fields	Part 1 - Chapter 20 & 21	Online Quiz 2 opens Monday 6:00 am AEST

Week 5 - 12 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Electric Currents and DC Circuits	Part 1 - Chapter 22 & 23	Online Quiz 2 Due Week 5 Sunday 11:45 pm AEST

Vacation Week - 19 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 26 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Capacitors and RC circuits	Part 1 - Chapter 21 & 23	29 th to 31 st August : Residential School in Rockhampton In-Class test Due Week 6

Week 7 - 02 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Magnetism and Inductors	Part 1 - Chapter 24	Online Quiz 3 opens Monday 6:00 am AEST

Week 8 - 09 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Fundamentals of Alternating Current Circuits	Part 3 - Chapter 32	Online Quiz 3 Due Week 8 Sunday 11:45 pm AEST Laboratory Activities and Report I Due: Week 8 Friday (13 Sept 2019) 11:45 pm AEST

Week 9 - 16 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Alternating Current Circuits Analysis	Part 3 - Chapter 32	Online Quiz 4 opens Monday 6:00 am AEST

Week 10 - 23 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Rotational Motion	Part 1 - Chapter 7	Online Quiz 4 Due Week 10 Sunday 11:45 pm AEST

Week 11 - 30 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Electrical Machines	Part 1 - Chapter 24 & 25	Online Quiz 5 opens Monday 6:00 am AEST Laboratory Activities and Report II Due: Week 11 Friday (4 Oct 2019) 11:45 pm AEST

Week 12 - 07 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
Exam Revision		Online Quiz 5 Due Week 12 Sunday 11:45 pm AEST

Review/Exam Week - 14 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Exam Week - 21 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Assessment Tasks

1 Online Progressive tests

Assessment Type

Online Quiz(zes)

Task Description

The assessment is accessible via the unit Moodle site and comprises of a set of online multiple choice questions on the topics covered each week. These progressive tests are an important activity to check and enhance your comprehension. The progressive tests are an integrated part of the study to test on the key aspects of each topic. Accurately completing the Progressive tests are vital for proper preparation for In-class test and end of term examination.

Each online progressive test quiz weights (2%) of your final mark (10% in total). Each progressive test will be available up to 1 week after the relevant fortnight to allow some study flexibility. For example progressive test on topics covered in Week 1 and 2 will close at the end of Week 3. Each attempt will include questions randomly selected from a set of related problems. Correct answers will be available immediately after you complete the test. If you encounter any network access during tests, contact the unit coordinator at your earliest convenience. Further details of the assessment will be available on the unit Moodle site at the beginning of the term.

- Each progressive test has set time to complete and once a student start a test, it will close after the set time.
- Once started, a test cannot be paused in the middle. Students are strongly advised to sufficiently cover the material related to each test before starting the test.
- You can attempt each test 2 times, within the given time frame as specified in the schedule.
- Final mark will be the highest of all the attempts

Number of Quizzes

5

Frequency of Quizzes

Other

Assessment Due Date

Progressive Test 1, 2, 3, 4, and 5 due on Week 3, 5, 8, 10 and 12 on Sunday at 11.45 pm AEST respectively.

Return Date to Students

Results are available immediately after the completion of each progressive test

Weighting

10%

Assessment Criteria

No Assessment Criteria

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Solve well defined engineering problems in work, energy and heat transfer
- Apply physical and circuit laws to find electric fields, electric potentials and currents in Direct Current (DC) circuits
- Calculate simple capacitor and inductor dimensions and transient behaviour of Resistor-Capacitor (RC) and Resistor-Inductor (RL) circuits
- Analyse simple Alternating Current (AC) circuits

- Solve problems related to rotational motion, and electrical machines

Graduate Attributes

- Problem Solving
- Critical Thinking
- Information Technology Competence

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 and problem solving skills.

Online students will sit this test during Residential School and on-campus students will sit for this test in their respective campuses.

Assessment Due Date

In Week 6. Suggested date and time will be notified and confirmed via the unit Moodle site.

Return Date to Students

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

Weighting

25%

Minimum mark or grade

25%

Assessment Criteria

In-class test will be graded using the following criteria:

- Correct answers
- All working must be shown
- Answers must be neat, tidy and legible
- Correct format
- Application of correct methods and procedures
- Discussion of answers
- All questions must be attempted
- Each question in the test will be assessed separately.
- Need to score more than 25% to PASS

Referencing Style

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

Submission

Offline

Learning Outcomes Assessed

- Solve well defined engineering problems in work, energy and heat transfer
- Apply physical and circuit laws to find electric fields, electric potentials and currents in Direct Current (DC) circuits

Graduate Attributes

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

3 Laboratory Activities and Report I

Assessment Type

Practical and Written Assessment

Task Description

This assessment item covers topics from 1 to 5

Laboratory sessions will be held at various times, as directed by the unit Moodle site, through the term or in case of online students at the residential school. All the information regarding the laboratories will be provided to the students via the unit Moodle site.

Laboratory **attendance is compulsory** and all students **must pass** the laboratory exercise assessment in order to pass the unit. Laboratory reports of students who did not attend the laboratory sessions will not be accepted for marking and will be awarded zero marks.

Details of the laboratory exercises will be posted on the unit website at the start of the term.

Students will be working in teams during the laboratory sessions.

Assessment Due Date

Week 8 Friday (13 Sept 2019) 11:45 pm AEST

Return Date to Students

Week 10 Friday (27 Sept 2019)

We strive to return assessments within 2 weeks after due date

Weighting

12%

Minimum mark or grade

Combined laboratory part I and II marks need to be more than 50%

Assessment Criteria

Laboratory exercises will be graded using the following criteria:

- Correct answers
- Correct format
- Correct description of laboratory procedures
- Discussion of laboratory results
- All working must be shown
- Proper use of references
- Report must be neat, tidy and legible
- All laboratory exercises must be attempted
- Combined laboratory part I and II marks need to be more than 50% to PASS

Referencing Style

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

Submission

Online Group

Learning Outcomes Assessed

- Conduct scientific experiments to investigate physical phenomena using safe work practices
- Work individually and collaboratively in a team to produce professional laboratory documentation including error analyses.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Team Work
- Information Technology Competence
- Ethical practice

4 Laboratory Activities and Report II

Assessment Type

Practical and Written Assessment

Task Description

This assessment item covers topics from 6 to 11.

Laboratory sessions will be held at various times, as directed by the unit Moodle site, through the term or in case of online students at the residential school. All the information regarding the laboratories will be provided to the students via the unit Moodle site.

Laboratory **attendance is compulsory** and all students **must pass** the laboratory exercise assessment in order to pass the unit. Laboratory reports of students who did not attend the laboratory sessions will not be accepted for marking and will be awarded zero marks.

Details of the laboratory exercises will be posted on the unit website at the start of the term.

Students will be working in teams during the laboratory sessions.

Assessment Due Date

Week 11 Friday (4 Oct 2019) 11:45 pm AEST

Return Date to Students

Exam Week Friday (25 Oct 2019)

We strive to return assessments within 2 weeks after due date

Weighting

13%

Minimum mark or grade

Combined laboratory part I and II marks need to be more than 50%

Assessment Criteria

Laboratory exercises will be graded using the following criteria:

- Correct answers
- Correct format
- Correct description of laboratory procedures
- Discussion of laboratory results
- All working must be shown
- Proper use of references
- Report must be neat, tidy and legible
- All laboratory exercises must be attempted
- Combined laboratory part I and II marks need to be more than 50% to Pass

Referencing Style

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

Submission

Online Group

Learning Outcomes Assessed

- Conduct scientific experiments to investigate physical phenomena using safe work practices
- Work individually and collaboratively in a team to produce professional laboratory documentation including error analyses.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Team Work
- Information Technology Competence
- Ethical practice

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%

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