ENEG11009 *Fundamentals of Energy and Electricity*

Term 2 - 2017

Profile information current as at 27/04/2024 01:16 pm

General Information

Overview

In this unit, you will learn how to apply fundamental laws of physics related to energy and electricity to real world 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 lab reports. Distance 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 - 2017

- Bundaberg
- Cairns
- Distance
- Gladstone
- Mackay
- 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. **Written Assessment**
Weighting: 15%
2. **Written Assessment**
Weighting: 15%
3. **Practical and Written Assessment**
Weighting: 20%
4. **Online Quiz(zes)**
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 Course Evaluation

Feedback
Assignments should be released early to give students (especially FLEX students) more time to plan for their work.

Recommendation
Assignments will be released at the start of the term next year.

Feedback from Course Evalaution

Feedback
Tutorials (including online tutorials) were run well and were very useful in understanding the application of theory.

Recommendation
This practice will continue

Feedback from Course Evaluation

Feedback
Recommended eText book was harder to use than a print textbook.

Recommendation
eTextbook was used mainly as a cost saving measure for students. More information will be provided regarding the print textbooks.

Feedback from Course Evaluation, Lab discusisons

Feedback
Lab exercises were well designed and helped understand the course content

Recommendation
Lab exercises will continue

Feedback from Course Evaluation

Feedback
Resources provided as well the commitment from the teaching staff was excellent

Recommendation
These practices will continue

Feedback from Course Evalaution

Feedback
Workload of the course was too high.

Recommendation
Course content and the assessment items will be reviewed to identify where the workload can be reduced.

Feedback from Teaching team discusisons

Feedback
Low success rate of the course is believed to be mainly due to the low student attendance in classes.

Recommendation
Explore the possibility of conducting short tests/quizzes in tutorials. Educate the students about the importance of continuous engagement.

Unit Learning Outcomes

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

1. Solve simple engineering problems in energy, heat, rotational motion, electricity and magnetism
2. Apply information literacy skills to research and evaluate information needed for effective independent learning
3. Explain the operating principles of laboratory equipment and perform error analyses
4. Investigate physical phenomena using scientific experiments and safe work practices
5. Create professional documentation of the solutions, designs and analyses using engineering terminologies, diagrams and symbols that conform to Australian Standards
6. Work individually and collaboratively in a team to produce quality outputs

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

— 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 - 15%	•	•			•	•
2 - Written Assessment - 15%	•	•	•		•	•
3 - Practical and Written Assessment - 20%	•		•	•	•	•
4 - Examination - 40%	•				•	•
5 - Online Quiz(zes) - 10%	•					•

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	•	•	•	•	•	•

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
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 - 15%	•	•	•	•		•				
2 - Written Assessment - 15%	•	•	•	•		•				
3 - Practical and Written Assessment - 20%	•	•	•		•	•	•	•		
4 - Examination - 40%	•	•	•							
5 - Online Quiz(zes) - 10%		•	•			•				

Textbooks and Resources

Textbooks

ENEG11009

Prescribed

Fundamentals of Energy and Electricity
1st edition (2016)
Authors: Knight, R.
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
s.desilva@cqu.edu.au

Schedule

Week 1 - 10 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Work, Energy and Power	Part 1 - Chapter 10 & 11	

Week 2 - 17 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Thermodynamics	Part 1 - Chapter 11 Part 2 - Chapter 13, 14 & 15	

Week 3 - 24 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Thermal Properties of Matter	Part 1 - Chapter 11 Part 2 - Chapter 13, 14 & 15	Progressive Test 1 : Due Sunday 11:45 PM AEST

Week 4 - 31 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Electric Charges and Fields	Part 1 - Chapter 20 & 21	Residential School Wednesday - Friday

Week 5 - 07 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Electric Currents and DC Circuits	Part 1 - Chapter 22 & 23	Progressive Test 2 : Due Sunday 11:45 PM AEST

Vacation Week - 14 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
		Assignment 1 Due: Vacation Week Monday (14 Aug 2017) 11:45 am AEST

Week 6 - 21 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Capacitors and RC circuits	Part 1 - Chapter 21 & 23	

Week 7 - 28 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Magnetism and Inductors	Part 1 - Chapter 24	Lab Report Part I Due Monday 11:45 AM AEST Progressive Test 3 : Due Sunday 11:45 PM AEST

Week 8 - 04 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Fundamentals of Alternating Current Circuits	Part 3 - Chapter 32	

Week 9 - 11 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Alternating Current Circuits Analysis	Part 3 - Chapter 32	Progressive Test 4 : Due Sunday 11:45 PM AEST

Week 10 - 18 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Rotational Motion and Oscillations	Part 1 - Chapter 14 Chapter 7 of " College Physics: A Strategic Approach" by Knight R (will be available as Online Course Resource)	

Week 11 - 25 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Electrical Machines	Part 1 - Chapter 24 & 25	Progressive Test 5 : Due Sunday 11:45 PM AEST **Assignment 2** Due: Week 11 Monday (25 Sept 2017) 11:45 am AEST

Week 12 - 02 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
Exam Revision		Lab Report Part II Due Monday 11:45 AM AEST **Laboratory Activities and Report** Due: Week 12 Monday (2 Oct 2017) 11:45 am AEST

Review/Exam Week - 09 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic

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 covers the topics 1-4. The assignment questions will be released on the unit website at the beginning of the term. Handwritten scanned calculations and formulas will be accepted. Students can scan clear and legible handwritten calculations for online submission.

Assessment Due Date
Vacation Week Monday (14 Aug 2017) 11:45 am AEST

Return Date to Students

We strive to return assessments within 2 weeks after due date

Weighting
15%

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

- Correct answers;

- Correct format;
- All working must be shown to obtain marks;
- Assignments must be neat, tidy and legible;
- All questions must be attempted.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
PDF is the preferred submission format

Learning Outcomes Assessed

- Solve simple engineering problems in energy, heat, rotational motion, electricity and magnetism
- Apply information literacy skills to research and evaluate information needed for effective independent learning
- Create professional documentation of the solutions, designs and analyses using engineering terminologies, diagrams and symbols that conform to Australian Standards
- Work individually and collaboratively in a team to produce quality outputs

Graduate Attributes

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

2 Assignment 2

Assessment Type
Written Assessment

Task Description
This assessment item covers topics 5-11. The assignment questions will be released on the unit website at the beginning of the term. Handwritten scanned calculations and formulas will be accepted. Students can scan clear and legible handwritten calculations for online submission.

Assessment Due Date
Week 11 Monday (25 Sept 2017) 11:45 am AEST

Return Date to Students

We strive to return assessments within 2 weeks after due date

Weighting
15%

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

- Correct answers;
- Correct format;
- All working must be shown to obtain marks;
- Assignments must be neat, tidy and legible;
- All questions must be attempted.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
PDF is the preferred submission format

Learning Outcomes Assessed

- Solve simple engineering problems in energy, heat, rotational motion, electricity and magnetism
- Apply information literacy skills to research and evaluate information needed for effective independent learning
- Explain the operating principles of laboratory equipment and perform error analyses
- Create professional documentation of the solutions, designs and analyses using engineering terminologies, diagrams and symbols that conform to Australian Standards
- Work individually and collaboratively in a team to produce quality outputs

Graduate Attributes

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

3 Laboratory Activities and Report

Assessment Type
Practical and Written Assessment

Task Description
This assessment item covers all topics.
Laboratory sessions will be held at various times, as directed by the unit Moodle site, through the term or in the case of distance students at the residential school. All 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**.
Details of the laboratory exercises will be posted on the unit website at the start of the term.
Although students will be working in teams during the laboratory session, each student must submit an individual lab report (not one report per lab group) by the due date(s).

Assessment Due Date
Week 12 Monday (2 Oct 2017) 11:45 am AEST
Lab Report Part I Due on Monday Week 7 11:45 AM AEST and Lab Report Part II Due on Monday Week 12 11:45 AM AEST

Return Date to Students

We strive to return assessments within 2 weeks after due date

Weighting
20%

Minimum mark or grade
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.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
PDF is the preferred submission format

Learning Outcomes Assessed

- Solve simple engineering problems in energy, heat, rotational motion, electricity and magnetism
- Explain the operating principles of laboratory equipment and perform error analyses
- Investigate physical phenomena using scientific experiments and safe work practices
- Create professional documentation of the solutions, designs and analyses using engineering terminologies, diagrams and symbols that conform to Australian Standards
- Work individually and collaboratively in a team to produce quality outputs

Graduate Attributes

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

4 Online Progressive Tests

Assessment Type
Online Quiz(zes)

Task Description
This 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 of key concepts. Accurately completing the Progressive Tests are vital for proper exam preparation. Each Progressive Test has a set time. Once started, it cannot be paused and will close after this period.
Be well prepared before starting each test. It is strongly advised to thoroughly study the relevant topics as **the score from your first attempt only is recorded in Moodle grade book**. Each Progressive Test can be attempted several times to assist with exam preparation. Each Progressive Test will be available up to 1 week after the relevant fortnight to allow some study flexibility. For example, The Progressive Test on topics covered in Weeks 1 and 2 will close at the end of Week 3, and you will have until Week 5 go complete the test for topics covered in Weeks 3 and 4. 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 issues 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.

Number of Quizzes
5

Frequency of Quizzes
Fortnightly

Assessment Due Date

Sunday Weeks 3,5,7,9, and 11 at 11:45 PM AEST

Return Date to Students

Results are available immediately after the completion of each quiz.

Weighting
10%

Assessment Criteria
No Assessment Criteria

Referencing Style

- Harvard (author-date)

Submission
Online

Learning Outcomes Assessed

- Solve simple engineering problems in energy, heat, rotational motion, electricity and magnetism
- Work individually and collaboratively in a team to produce quality outputs

Graduate Attributes

- 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

Exam Conditions
Restricted.

Materials
Calculator - all non-communicable calculators, including scientific, programmable and graphics calculators are authorised
Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

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