ENAM12005 *Thermal Energy Plant*
Term 2 - 2018

Profile information current as at 25/04/2024 06:51 am

General Information

Overview

This unit introduces students to the analysis of thermal energy plant using basic principles of thermodynamics. They will be able to use standard thermodynamics tables and solve basic problems relating to flow and non-flow processes; apply the laws of thermodynamics and energy equations to basic energy plant problems; and analyse heat engine and refrigeration cycles. Students are required to communicate effectively regarding technical aspects of thermodynamics, prepare technical and laboratory reports, clearly document technical procedures problem solutions, and evaluate uncertainties and the results of their work. They are required to develop a capacity to work and communicate ethically and professionally, as individuals and in teams, to investigate and solve problems and present solutions professionally. A compulsory residential school is provided to promote development of unit learning outcomes.

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: [ENAG11002 Energy and Electricity or ENTA11005 Engineering Science] and MATH11160
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 - 2018

- Mixed Mode

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: 35%
2. **Written Assessment**
Weighting: 35%
3. **On-campus Activity**
Weighting: 25%
4. **Presentation**
Weighting: 5%

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 survey

Feedback
Moodle was set up very well.

Recommendation
This practice will be continued in future offerings.

Feedback from Course evaluation survey

Feedback
Residential school was very good, but may be shortened.

Recommendation
The residential school includes introduction session, three different experiments, lab report preparation sessions, tutorial session and course assignment discussion sessions. With all these activities, it will be difficult to shorten the residential school.

Unit Learning Outcomes

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

1. Use tables of properties for fluids and explain and solve basic problems relating to flow and non-flow process.
2. Apply the first law of thermodynamics, second law of thermodynamics and other energy equations to basic problems in thermodynamics.
3. Analyse typical heat engine cycles and refrigeration cycles.
4. Prepare technical and laboratory reports with evidence of thorough evaluation of experimental uncertainties and results obtained.
5. Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development.
6. Solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems.

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 - 35%	•	•	•	•	•	•
2 - Written Assessment - 35%	•	•	•	•	•	•
3 - On-campus Activity - 25%	•	•	•	•	•	•
4 - Presentation - 5%	•	•	•	•	•	•

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 - 35%	•	•	•	•		•		•		
2 - Written Assessment - 35%	•	•	•	•		•		•		
3 - On-campus Activity - 25%	•	•	•	•	•	•		•		
4 - Presentation - 5%	•	•	•	•		•		•		

Textbooks and Resources

Textbooks

ENAM12005

Prescribed

Thermodynamics: Advanced Applications
(1997)
Authors: Kinsky, R.
McGraw-Hill
North Ryde , NSW , Australia
ISBN: 9780074703120
Binding: Paperback
ENAM12005

Prescribed

Thermodynamics and Fluid Mechanics: An Introduction
(1996)
Authors: Kinsky, R.
McGraw-Hill
North Ryde , NSW , Australia
ISBN: 9780074702383
Binding: Paperback

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Access to a computer with webcam, microphone and headphones/speakers for online tutorials
- Scanner

Referencing Style

All submissions for this unit must use the referencing styles below:

- Harvard (author-date)
- Turabian

For further information, see the Assessment Tasks.

Teaching Contacts

Ramadas Narayanan Unit Coordinator
r.narayanan@cqu.edu.au

Schedule

Week 1 - 09 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Energy and Humanity	Thermodynamics and Fluid Mechanics : An Introduction. Chapter1	Zoom Tutorial

Week 2 - 16 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Basic concepts	Thermodynamics and Fluid Mechanics : An Introduction. Chapter 2	Zoom Tutorial Week 2 online quiz

Week 3 - 23 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Energy	Thermodynamics and Fluid Mechanics : An Introduction. Chapter 3	Zoom Tutorial Week 3 online quiz

Week 4 - 30 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Closed and open systems	Thermodynamics and Fluid Mechanics : An Introduction. Chapter 4	Zoom Tutorial Week 4 online quiz

Week 5 - 06 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Gases	Thermodynamics and Fluid Mechanics : An Introduction. Chapter 5	Zoom Tutorial Week 5 online quiz

Vacation Week - 13 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Vacation		

Week 6 - 20 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Heat engines	Thermodynamics and Fluid Mechanics : An Introduction. Chapter 6	Zoom Tutorial Week 6 online quiz

Week 7 - 27 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Heat engine performance	Thermodynamics and Fluid Mechanics : An Introduction. Chapter 7	Zoom Tutorial Week 7 online quiz

Week 8 - 03 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Steam-water systems	Thermodynamics : Advanced Applications. Chapter 3	Zoom Tutorial Week 8 online quiz

Week 9 - 10 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Residential school	Lab experiments	

Week 10 - 17 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Refrigeration and heat pumps	Thermodynamics : Advanced Applications. Chapter 4	Zoom Tutorial **Residential School Activities Report** Due: Week 10 Friday (21 Sept 2018) 11:45 pm AEST

Week 11 - 24 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Heat transfer	Thermodynamics : Advanced Applications. Chapter 1	Zoom Tutorial

Week 12 - 01 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic

Revision	All chapters previously stated	Zoom Tutorial **Assignment** Due: Week 12 Friday (5 Oct 2018) 11:45 pm AEST

Review/Exam Week - 08 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic
		Video Presentation Due: Review/Exam Week Friday (12 Oct 2018) 11:45 pm AEST

Exam Week - 15 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Weekly Online quizzes

Assessment Type
Written Assessment

Task Description
These weekly quizzes assess contents from each week. There will be 7 quizzes starting from week 2 extending up to week 8. All quizzes together will have 35% weighting of the unit. The assessment task can be accessed from the unit Moodle site on a weekly basis. Each quiz will be open for a week and students need to attempt within the open period.

Assessment Due Date

Weekly due dates will be given in the Moodle

Return Date to Students

Students will be getting feedback immediately after the submission of the quizzes.

Weighting
35%

Minimum mark or grade
50%

Assessment Criteria
The correct answer will get full marks and the incorrect answer will be given zero marks.

Referencing Style

- Harvard (author-date)
- Turabian

Submission
Online

Learning Outcomes Assessed

- Use tables of properties for fluids and explain and solve basic problems relating to flow and non-flow process.
- Apply the first law of thermodynamics, second law of thermodynamics and other energy equations to basic problems in thermodynamics.
- Analyse typical heat engine cycles and refrigeration cycles.
- Prepare technical and laboratory reports with evidence of thorough evaluation of experimental uncertainties and results obtained.
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development.
- Solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems.

Graduate Attributes

- Communication
- Problem Solving

- Critical Thinking
- Information Literacy
- Information Technology Competence
- Ethical practice

2 Assignment

Assessment Type
Written Assessment

Task Description
Assignment is based on content from week 1 until week 11 inclusive.
Questions will be released in Moodle at the beginning of the term

Assessment Due Date
Week 12 Friday (5 Oct 2018) 11:45 pm AEST

Return Date to Students

2 weeks after the due date

Weighting
35%

Minimum mark or grade
50%

Assessment Criteria
It will be graded based on the presentation, the method of solution, appropriate explanation and completeness of the solution. A complete solution should include any assumptions made, relevant sketches, clear step by step solution and conclusion/judgement on the answer. Detailed criteria will be given in the assignment task sheet.

Referencing Style

- Harvard (author-date)
- Turabian

Submission
Online

Learning Outcomes Assessed

- Use tables of properties for fluids and explain and solve basic problems relating to flow and non-flow process.
- Apply the first law of thermodynamics, second law of thermodynamics and other energy equations to basic problems in thermodynamics.
- Analyse typical heat engine cycles and refrigeration cycles.
- Prepare technical and laboratory reports with evidence of thorough evaluation of experimental uncertainties and results obtained.
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development.
- Solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems.

Graduate Attributes

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

3 Residential School Activities Report

Assessment Type
On-campus Activity

Task Description
Attend the residential school and participate in the learning activities and complete a report. Details of the residential school activities will be available in Moodle.
The residential school is compulsory and students must attend to pass the unit.

Assessment Due Date
Week 10 Friday (21 Sept 2018) 11:45 pm AEST

Return Date to Students

Two weeks after the submission

Weighting
25%

Minimum mark or grade
50%

Assessment Criteria
Students will be assessed on attendance, participation, test results, presentation skills, experimental activities and reflections.

Referencing Style

- Harvard (author-date)
- Turabian

Submission
Online

Learning Outcomes Assessed

- Use tables of properties for fluids and explain and solve basic problems relating to flow and non-flow process.
- Apply the first law of thermodynamics, second law of thermodynamics and other energy equations to basic problems in thermodynamics.
- Analyse typical heat engine cycles and refrigeration cycles.
- Prepare technical and laboratory reports with evidence of thorough evaluation of experimental uncertainties and results obtained.
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development.
- Solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems.

Graduate Attributes

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

4 Video Presentation

Assessment Type
Presentation

Task Description
Prepare a video presentation on your learning in this unit. Length : Maximum 5 minutes.

Assessment Due Date
Review/Exam Week Friday (12 Oct 2018) 11:45 pm AEST

Return Date to Students

The assessment feedback will be given 2 weeks after the due date.

Weighting
5%

Assessment Criteria
Student demonstrates understanding of the unit learning outcomes and reflects on their learning in the unit
Quality of presentation slides and video presentation.More information will be there in the moodle.

Referencing Style

- Harvard (author-date)
- Turabian

Submission
Online

Learning Outcomes Assessed

- Use tables of properties for fluids and explain and solve basic problems relating to flow and non-flow process.
- Apply the first law of thermodynamics, second law of thermodynamics and other energy equations to basic problems in thermodynamics.
- Analyse typical heat engine cycles and refrigeration cycles.
- Prepare technical and laboratory reports with evidence of thorough evaluation of experimental uncertainties and results obtained.
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development.
- Solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems.

Graduate Attributes

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

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