ENEM20003 *Thermofluids Engineering Applications*

Term 1 - 2020

Profile information current as at 20/04/2024 04:01 pm

All details in this unit profile for ENEM20003 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 06-05-20

As per the instruction given by the University to deliver all units online in T1 2020, the assessment item “Class Test” (30 marks) will be conducted as an online test. Further details will be available in Moodle. The learning outcomes assessed will be unchanged.

General Information

Overview

This unit will equip you with advanced knowledge and applications of the principles of thermodynamics, fluid mechanics and heat transfer to the design and analysis of complex thermofluid systems. You will apply your knowledge and understanding to evaluate the performance of air conditioning, cooling tower and other heat and energy transfer processes in various industrial plants. You will achieve the learning outcomes through an integration of advanced theoretical concepts and the application of modelling approaches, and experimental methods to solve industrial thermofluid problems. You will work both individually and collaboratively, to solve problems, and document and communicate your work clearly in a professional manner.

Details

Career Level: *Postgraduate*
Unit Level: *Level 8*
Credit Points: *12*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.25*

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 1 - 2020

- Melbourne
- Perth
- 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 12-credit Postgraduate unit at CQUniversity requires an overall time commitment of an average of 25 hours of study per week, making a total of 300 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: 25%
2. **Written Assessment**
Weighting: 25%
3. **Laboratory/Practical**
Weighting: 20%
4. **In-class Test(s)**
Weighting: 30%

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.

Unit Learning Outcomes

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

1. Apply the principles of thermodynamics, fluid mechanics and heat transfer to design complex thermofluid processes related to air-conditioning, heating, cooling and ventilation systems
2. Apply advanced knowledge and methodologies to critically evaluate the performance of complex mass, heat and energy transfer systems
3. Apply discipline-specific theories to critically analyse the operating characteristics of pumps and turbines
4. Model fluid dynamics problems using advanced numerical methods
5. Work collaboratively in a team, communicate professionally and develop high-quality technical documentation related to theoretical, experimental and computational modalities in the discipline.

The learning outcomes are linked to Engineers Australia Stage 1 Competency Standard and Australian Qualification Framework (AQF) 9 Level.

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
1 - Written Assessment - 25%	•			•	
2 - Written Assessment - 25%		•	•		•
3 - Laboratory/Practical - 20%		•	•		•
4 - In-class Test(s) - 30%	•			•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
1 - Knowledge	∘	∘	∘	∘	
2 - Communication					∘
3 - Cognitive, technical and creative skills	∘	∘	∘	∘	
4 - Research		∘		∘	
5 - Self-management					∘
6 - Ethical and Professional Responsibility					∘
7 - Leadership					∘

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
8 - 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
1 - Written Assessment - 25%	∘			∘	∘			
2 - Written Assessment - 25%	∘	∘	∘	∘				
3 - Laboratory/Practical - 20%		∘	∘	∘	∘	∘		
4 - In-class Test(s) - 30%	∘							

Textbooks and Resources

Textbooks

ENEM20003

Prescribed

Applied Thermodynamics for Engineering Technologists
Edition: 5 (1993)
Authors: Eastop and McConkey
Pearson Prentice Hall
ISBN: 978-0-582-09193-1
Binding: Paperback
ENEM20003

Prescribed

Engineering Fluid Mechanics
Edition: 12 (2019)
Authors: Donald F. Elger, Barbara A. LeBret, Clayton T. Crowe, John A. Roberson
Wiley
Milton , Queensland , Australia and New Zealand Edition
ISBN: 978-1-119-57081-3
Binding: Paperback
ENEM20003

Prescribed

Munson's Fluid Mechanics
8th Global Edition (2017)
Authors: P. M. Gerhart, A. L. Gerhart, J.I. Hochstein
John Wiley & Sons
ISBN: 978-1-119-24898-9
Binding: Paperback
ENEM20003

Prescribed

Refrigeration and Air Conditioning
Edition: 2 nd (1982)
Authors: Stoecker, Wilbert and Jones, Jerold
John Wiley & Sons
ISBN: 978-1-119-24898-9
Binding: Paperback

Additional Textbook Information
Paper copies can be purchased from the CQUni Bookshop here: http://bookshop.cqu.edu.au (search on the Unit code)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- ISL lectures to be presented at Bundaberg, Rockhampton and Mackay. Dates will be provided on Moodle after Term commencement.
- Computer - ability to access study materials, access Zoom application for meetings and view instructional videos.

Referencing Style

All submissions for this unit must use the referencing style: Harvard (author-date)
For further information, see the Assessment Tasks.

Teaching Contacts

Kalam Azad Unit Coordinator
a.k.azad@cqu.edu.au

Schedule

Week 1 - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Introduction and overview of course and assessment. Fluid flow- steady & unsteady flows, compressible & incompressible flows.	Munson: Ch 3, 4 and 5	**Tutorial:** Fluid Flows problems. **Workshop:** Introduction to Project 1 and handover - aims, objectives, and scopes.

Week 2 - 16 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Pumps - fluid flows, flow in pipes	Munson: Ch 8	**Tutorial:** Pipe flows, flow losses. **Workshop:** Discussion & feedback on Project 1.

Week 3 - 23 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Fluid machinery- analysis, performance, characteristics of pumps.	Munson: Ch 12	**Tutorial:** Fluid machinery & characteristics. **Workshop:** Discussion & feedback on Project 1. Pre-Test: A formative test will be conducted to ascertain the level of an individual's basic skills. This test is compulsory and will have PASS/FAIL grade. The date will be confirmed via Moodle.

Week 4 - 30 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Turbines - energy transfer calculations for Pelton Turbine.	Munson: Ch 12	**Tutorial:** Turbines design and calculations. **Workshop:** Project 1 Presentation.

Week 5 - 06 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Thermal comfort and psychrometry.	Stoecker: Ch 3 and 4 Eastop: Ch 15	**Tutorial:** Thermal comfort, Thermal principles, Psychrometry, steam Table and charts. **Workshop:** Project 1 report preparation assistance and support. **Project 1** Due: Week 5 Friday (10 Apr 2020) 11:59 pm AEST

Vacation Week - 13 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Vacation Week: No teaching material will be delivered.		

Week 6 - 20 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Mass, energy & heat transfer-cooling and dehumidification.	Stoecker: Ch 3 Eastop: Ch 15	**Tutorial:** Thermal comfort, Psychrometry and steam Table. **Workshop:** Introduction to Project 2 and hand over - aims, objectives, and scopes. **Lab 1 & 2 Report Due:** Week 6 Sunday (26 April 2020) 11:59 pm AEST

Week 7 - 27 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Heat and mass transfer in the thermodynamic system - heat exchanger, cooling tower.	Eastop: Ch 14 Stoecker: Ch 10 and 17	**Tutorial:** Cooling tower **Workshop:** Discussion & feedback on Project 2

Week 8 - 04 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Refrigeration - types/systems, coefficient of performance	Eastop Ch 14 Stoecker: Ch 10 and 17	**Tutorial:** Refrigeration system design. **Workshop:** Discussion & feedback on Project 2.

Week 9 - 11 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Air conditioning systems.	Eastop: Ch 15	**Tutorial:** Air conditioning systems design **Workshop:** Enquiries and feedback on Project 2. **Lab 3 & 4 Report Due**: **Laboratory report** Due: Week 9 Friday (15 May 2020) 11:59 pm AEST

Week 10 - 18 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Air conditioning - cooling & heating systems design.	Eastop: Ch 15 Stoecker: Ch 5	**Tutorial:** Air conditioning load calculation and ducting system design. **Workshop:** Project 2 Presentation.

Week 11 - 25 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Computational Fluid Dynamics (CFD)-Basic equations and modelling.	Munson: Section A	**Tutorial:** Navier-Stokes equations **Workshop:** Project 2 report preparation assistance and support. **Project 2** Due: Week 11 Friday (29 May 2020) 11:59 pm AEST

Week 12 - 01 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: The unit material review.	Review previous weeks unit materials	**Tutorial:** Review weekly materials and Demo class test. **Workshop:** Review.

Review/Exam Week - 08 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic

Class test: The suggested venue will be
confirmed and notified via Moodle. The schedule is as shown below.

Class test Due: Review/Exam Week Wednesday (10 June 2020) 2:00 pm AEST

Exam Week - 15 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

For more information, please contact the respective campus academic as shown below -
For Melbourne Campus: Dr Kalam Azad (Email: a.k.azad@cqu.edu.au, Phone: 03 9616 0409)
For Rockhampton Campus: Mr Hazrat Ali (Email: h.ali@cqu.edu.au, Mobile: 0416 580 310)
For Perth Campus: Mr Raju Ahamed (Email: r.ahamed@cqu.edu.au, Mobile: 0406 204 606)

Assessment Tasks

1 Project 1

Assessment Type
Written Assessment

Task Description
Students are required to undertake this project which will allow them to exercise and demonstrate their knowledge of fluid machinery and flows, and application skills in a fluid transportation system. In particular, they will be required to analyse and design a fluid flow/transportation system using fluid dynamics principles and piping systems and pumps. The project task and scope will be uploaded to the unit website (Moodle).

Assessment Due Date
Week 5 Friday (10 Apr 2020) 11:59 pm AEST
It is expected that the assessment item will be returned in 2 weeks after the due date.

Return Date to Students
Week 7 Friday (1 May 2020)

Weighting
25%

Minimum mark or grade
50%

Assessment Criteria
1. Reporting of necessary elements (e.g. introduction, theory, aims, objective, brief literature review, etc.) of the project.
2. Design of pump, piping system, development of system equation, duty point, cavitation checks, etc. for the given project.
3. Schematic diagram of the heat exchanger system, friction loss, heat transfer and sustainability of the energy conservation strategies.
4. Clarity of expression, including correct grammar, spelling, punctuation and appropriate referencing of sources.
5. Accurate and correct use and presentation of mathematical equations or graphs, tables, diagrams and/or drawings.
6. Discussion and logical presentation of ideas and arguments by means of data analysis and synthesis.

Detailed project assessment criteria, declaration of contribution and SPA templates will be provided on Moodle. This is a Team Project and initially, team submission will be assessed and a grade will be given for each team. Then individual grades will be determined using the equation below and based on their contribution and performance. Team members will need to submit the Team Charter (Declaration of individual student contributions) and SPA (Self and Peer Assessment) report. It may be possible that individual grade could be higher than the team mark, but capped at the maximum mark for the assessment.

Please note that if a team declares **ZERO** contribution for any of the members of the team in a submission for

assessment then he/she will not be considered as a team member (for equal team share calculation) for that particular assessment item. The report must meet the minimum standard of the set criteria regardless of the number of team members involved in this task to satisfy the requirement of this unit.
Individual student marks = Total project 1 marks achieved by the team out of 25 x (Individual share / Equal team share)
For example, Individual contributions of 3 students in Team A are given below. Team A received 36 marks (out of 40) for their project.
S1 - 30%; S2 - 33%; S3 - 37% (Total 100% contribution)
Based on the contribution, Individual marks are given as follows.
S1 = 36 x (30/33.3) = 32.4 (out of 40)
S2 = 36 x (33/33.3) = 35.6 (out of 40)
S3 = 36 x (37/33.3) = 40.0 (out of 40)
Please note: Students are advised to meet the submission due date to avoid the **delay penalty of 5% marks per day** which may be deducted for delaying in submission according to the CQUniversity assessment policy. The assessment item will not be accepted if the submission is delayed by more than **20 days** after the due date of the submission. Generally, the extension request will not be granted because it is a team submission, not individual submission. However, it could be considered for special circumstances based on the evidence (i.e. medical certificate from a GP or hospital medical certificate) of a serious medical condition of members of the team.

Referencing Style

- Harvard (author-date)

Submission
Online Group

Submission Instructions
Submission link will be provided on Moodle of this assessment item.

Learning Outcomes Assessed

- Apply the principles of thermodynamics, fluid mechanics and heat transfer to design complex thermofluid processes related to air-conditioning, heating, cooling and ventilation systems
- Model fluid dynamics problems using advanced numerical methods

Graduate Attributes

- Knowledge
- Research
- Self-management

2 Project 2

Assessment Type
Written Assessment

Task Description
Students are required to undertake this project which will allow them to exercise and demonstrate their theoretical thermo-fluid knowledge and skills in a practical application in the area of building HVAC systems. In particular, they will be required to investigate the energy and thermal performance of a reference building and develop energy management strategies for this building.
The project task and scope will be uploaded to the unit website (Moodle).

Assessment Due Date
Week 11 Friday (29 May 2020) 11:59 pm AEST
It is expected that the assessment item will be returned in 2 weeks after the due date.

Return Date to Students
Review/Exam Week Friday (12 June 2020)

Weighting
25%

Minimum mark or grade
50%

Assessment Criteria
1. Reporting of necessary elements (e.g. introduction, theory, aims, objective, brief literature review, clear methodology, etc.) for the given project.
2. Design of HVAC system, cooling, and heating load calculation, model development and simulation for thermal comfort profile, etc. for the given project.

3. Single zone and multi-zone modelling, evaluation of alternative HVAC system, CFD analysis and sustainable energy conservation measure.
4. Clarity of expression, including correct grammar, spelling, punctuation and appropriate referencing of sources.
5. Accurate and correct use and presentation of mathematical equations or graphs, tables, diagrams and/or drawings.
6. Discussion and logical presentation of ideas and arguments by means of data analysis and synthesis.

Detailed project assessment criteria, declaration of contribution and SPA templates will be provided on Moodle. This is a Team Project and initially, team submission will be assessed and a grade will be given for each team. Then individual grades will be determined using the equation below and based on their contribution and performance. Team members will need to submit the Team Charter (Declaration of individual student contributions) and SPA (Self and Peer Assessment) report. It may be possible that individual grade could be higher than the team mark, but capped at the maximum mark for the assessment.

Please note that if a team declares ZERO contribution for any of the members of the team in a submission for assessment then he/she will not be considered as a team member (for equal team share calculation) for that particular assessment item. The report must meet the minimum standard of the set criteria regardless of the number of team members involved in this task to satisfy the requirement of this unit.
Individual student marks = Total project 2 marks achieved by the team out of 25 x (Individual share / Equal team share)
For example, Individual contributions of 3 students in Team A are given below. Team A received 36 marks (out of 40) for their project.
S1 - 30%; S2 - 33%; S3 - 37% (Total 100% contribution)
Based on the contribution, Individual marks are given as follows.
S1 = 36 x (30/33.3) = 32.4 (out of 40)
S2 = 36 x (33/33.3) = 35.6 (out of 40)
S3 = 36 x (37/33.3) = 40.0 (out of 40)
Please note: Students are advised to meet the submission due date to avoid the **delay penalty of 5% marks per day** which may be deducted for delaying in submission according to the CQUniversity assessment policy. The assessment item will not be accepted if the submission is delayed by more than **20 days** after the due date of the submission. Generally, the extension request will not be granted because it is a team submission, not individual submission. However, it could be considered for special circumstances based on the evidence (i.e. medical certificate from a GP or hospital medical certificate) of a serious medical condition of members of the team.

Referencing Style

- Harvard (author-date)

Submission
Online Group

Submission Instructions
Submission link will be provided on Moodle of this assessment item.

Learning Outcomes Assessed

- Apply advanced knowledge and methodologies to critically evaluate the performance of complex mass, heat and energy transfer systems
- Apply discipline-specific theories to critically analyse the operating characteristics of pumps and turbines
- Work collaboratively in a team, communicate professionally and develop high-quality technical documentation related to theoretical, experimental and computational modalities in the discipline.

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research

3 Laboratory report

Assessment Type
Laboratory/Practical

Task Description
Each student will be required to complete the laboratory exercises as per the instruction sheets which will be available on the unit website. Laboratory sessions are compulsory, and each session will be up to 2 hours in duration. The timetable of laboratories will be supplied separately via the unit website (Moodle).
Statement on Safety

According to the Workplace Health and Safety Act, 1995, it is a legal requirement that all persons at a workplace must not act in a manner that endangers the health or safety of any person at that workplace. As a student, your University is your workplace. When attending laboratories, workshops and field activities, fully enclosed footwear covering the whole foot must be worn at all times. Other personal protective equipment must be worn when required, or as directed by the lecturer or technical officer-in-charge. All requirements of the School Workplace Clothing Policy must also be observed. In the laboratory, clothing must fully cover the torso and have at least a short sleeve (i.e. no singlets). Failure to comply with any of the above health and safety requirements may result in your exclusion from laboratory, workshop or activities - most of which are compulsory.
At the laboratory session
Arrive early; communicate with other members of the groups, discuss individual tasks/contribution in readiness for the laboratory experiment.
Ensure to bring
Laboratory instruction sheets if any; Graph paper (A4 linear, 10 div/cm); Notebook (A4 hardbound); Ruler (30 cm clear plastic); Pen and pencil; Scientific calculator; Correct footwear.
Students are expected to complete the entire laboratory exercise including the drawing of graphs and calculating (excel sheet) the final answer. All raw data must be entered into the notebook immediately.
Laboratory submission cover sheet
Softcopy (electronic) submissions must be compiled as one single pdf file and submitted through the unit website (Moodle). The first page of the assignment must show the following information: Names, Student Numbers, Group No, Year, Term, Unit Code.

Assessment Due Date
Week 9 Friday (15 May 2020) 11:59 pm AEST
Lab reports submission is on a weekly basis as per the schedule provided.

Return Date to Students
Week 11 Friday (29 May 2020)

Weighting
20%

Minimum mark or grade
50% (average of all lab reports but not individual)

Assessment Criteria
Reporting of major elements/steps (i.e. Theory, Objective, Procedures, Results, etc.) taken to undertake the laboratory sessions (40% of total marks).
Clarity of expression, including correct grammar, spelling, punctuation and appropriate referencing of sources (10% of total marks).
Accurate and correct use and presentation of mathematical equations or graphs, tables, diagrams and/or drawings (30% of total marks).
Discussion and logical presentation of ideas and arguments by means of data analysis and synthesis (20% of total marks).
Assessment item details:
This is also a Team report submission and initially, team submission will be assessed and a grade will be given for each team. Then individual grades will be determined using the equation below and based on their contribution and performance. Team members will need to submit the Team Charter (Declaration of individual student contributions). It may be possible that individual grade could be higher than the team mark, but capped at the maximum mark for the assessment. Detailed lab report marking criteria and declaration of contribution templates will be provided on Moodle.
Individual student marks = Total lab marks achieved by the team out of 20 x (Individual share / Equal team share) x lab attendance
For example, Individual contributions of 3 students in Team A are given below. Team A received 16 marks (out of 20) for their lab.
S1 - 30%; S2 - 33%; S3 - 37% (Total 100% contribution)
Based on the contribution, Individual marks are given as follows.
S1 = 16 x (30/33.3) x 1 = 14.40 (out of 20)
S2 = 16 x (33/33.3) x 1 = 15.85 (out of 20)
S3 = 16 x (37/33.3) x 1 = 17.78 (out of 20)
Please note the key information:
1. Average 50% marks in all lab reports (but not individual) are the minimum requirement to pass in this assessment item.
2. The lab attendances are compulsory and really important because it is a mandatory component and a multiplication factor (i.e. **Present - 1, Absent - 0**) for individual mark calculation as shown in the above equation will be used. The student must follow the lab schedule which will be provided on Moodle.
3. Please follow the individual lab report due date as mentioned in the weekly schedule.
4. Students are advised to meet the submission due date to avoid the **delay penalty of 5% marks per day** which may

be deducted for delaying in submission according to the CQUniversity assessment policy. The assessment item will not be accepted if the submission is delayed by more than **20 days** after the due date of the submission. Generally, the extension request will not be granted because it is a team submission, not individual submission. However, it could be considered for special circumstances based on the evidence (i.e. medical certificate from a GP or hospital medical certificate) of a serious medical condition of members of the team.
5. If a team declares ZERO contribution for any of the members of the team in a submission for assessment then he/she will not be considered as a team member (for equal team share calculation) for that particular assessment item. The report must meet the minimum standard of the set criteria regardless of the number of team members involved in this task to satisfy the requirement of this unit.

Referencing Style

- Harvard (author-date)

Submission
Online Group

Submission Instructions
Submission link will be provided on Moodle of this assessment item

Learning Outcomes Assessed

- Apply advanced knowledge and methodologies to critically evaluate the performance of complex mass, heat and energy transfer systems
- Apply discipline-specific theories to critically analyse the operating characteristics of pumps and turbines
- Work collaboratively in a team, communicate professionally and develop high-quality technical documentation related to theoretical, experimental and computational modalities in the discipline.

Graduate Attributes

- Communication
- Cognitive, technical and creative skills
- Research
- Self-management
- Ethical and Professional Responsibility

4 Class test

Assessment Type
In-class Test(s)

Task Description
This assessment covers weekly topics from Week 1 to Week 11. Students are required to answer analytical and numerical questions to demonstrate their theoretical knowledge and analytical and solving skills in thermo-fluid processes.

Assessment Due Date
Review/Exam Week Wednesday (10 June 2020) 2:00 pm AEST
The individual student will sit for the class test in the given venue under the supervision of an academic.

Return Date to Students

The assessment marks will be provided along with the certification of Grades.

Weighting
30%

Minimum mark or grade
50%

Assessment Criteria
Each question in the test will be assessed separately for the criterion accuracy and correct results. A question will be deemed to have been completed if the student has shown a correct procedure and sound understanding of the work.

Referencing Style

- Harvard (author-date)

Submission
Offline

Submission Instructions
Answer script must be submitted offline (hard copy) before leaving the test venue.

Learning Outcomes Assessed

- Apply the principles of thermodynamics, fluid mechanics and heat transfer to design complex thermofluid processes related to air-conditioning, heating, cooling and ventilation systems
- Model fluid dynamics problems using advanced numerical methods

Graduate Attributes

- Knowledge

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