ENAM12003 *Engineering Fluids*
Term 1 - 2026

Profile information current as at 12/03/2026 12:04 pm

All details in this unit profile for ENAM12003 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student).The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview
This unit introduces you to key concepts and principles required to analyse problems involving engineering fluids. You will be able to explain how fluid properties relate to one another, apply principles of fluid statics, and analyse force and power associated with fluid flow. You will be able to analyse head loss and pump performance in pipe systems, select fluid machines for given applications, and analyse drag acting on bodies in fluid flow. You will be able to prepare technical and laboratory reports that demonstrate critical evaluation of results and experimental uncertainties.

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
Prerequisite: MATH11160 Technology Mathematics.
Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the Assessment Policy and Procedure (Higher Education Coursework).

Offerings For Term 1 - 2026
- Online

Attendance Requirements
All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website
This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

Regional Campuses
Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

Metropolitan Campuses
Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. Practical and Written Assessment
Weighting: 20%
2. Online Quiz(zes)
Weighting: 20%
3. Written Assessment
Weighting: 30%
4. Written Assessment
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.

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 In classroom

Feedback

Students appreciated the substantial learning in this unit on fluid flow characteristics and their industrial applications.

Recommendation

The same practice should be followed in the next offering.

Unit Learning Outcomes

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

1. Describe the basic properties of fluids, and the relationship between different fluid properties
2. Apply the fundamentals of fluid mechanics to investigate pressure, buoyancy and hydrostatic forces
3. Analyse force and power associated with the fluid flow using the continuity, Bernoulli and impulse-momentum equations
4. Analyse head loss in pipes, fittings and pipe systems, and determine pump performance (duty point) in piping systems
5. Explain the characteristics of fluid machines and select machines suitable for given applications
6. Determine drag forces acting on standard shaped objects in fluid flows
7. Work autonomously and in teams to prepare reports using appropriate engineering language.

The Learning Outcomes for this unit are linked with the Engineers Australia Stage 1 Competency Standards for Engineering Associates in the areas of 1. Knowledge and Skill Base, 2. Engineering Application Ability and 3. Professional and Personal Attributes at the following levels:

Intermediate

1.1 Descriptive, formula-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the practice area. (LO: 1N 2I 3I 4I 5N 6I 7I)

1.2 Procedural-level understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the practice area. (LO: 1N 2N 3I 4I 5I 6I 7I)

1.3 In-depth practical knowledge and skills within the specialist sub-disciplines of the practice area. (LO: 1I 2I 3I 4I 5I 6I 7I)

1.4 Discernment of engineering developments within the practice area. (LO: 1I 2I 3I 4I 5I 6N 7I)

1.5 Knowledge of engineering design practice and contextual factors impacting the practice area. (LO: 2I 3I 4I 5I 6I)

2.1 Application of established technical and practical methods to the solution of well-defined engineering problems. (LO: 1I 2I 3I 4I 5I 6I 7I)

2.2 Application of technical and practical techniques, tools and resources to well-defined engineering problems. (LO: 1N 2N 3N 4N 5I 6N 7I)

3.1 Ethical conduct and professional accountability. (LO: 7I)

3.2 Effective oral and written communication in professional and lay domains. (LO: 1N 2N 3N 4N 5N 6N 7I)

3.3 Creative, innovative and pro-active demeanour. (LO: 1N 2N 3N 4N 5N 6N 7I)

3.4 Professional use and management of information. (LO: 1N 2N 3I 4I 5I 6I 7I)

3.6 Effective team membership and team leadership. (LO: 7I)

Advanced

3.5 Orderly management of self, and professional conduct. (LO: 7A)

Note: LO refers to the Learning Outcome number(s) which link to the competency and the levels: N – Introductory, I – Intermediate and A - Advanced.

Refer to the Engineering Undergraduate Course Moodle site for further information on the Engineers Australia's Stage 1 Competency Standard for Professional Engineers and course level mapping information https://moodle.cqu.edu.au/course/view.php?id=1511

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	7
1 - Practical and Written Assessment - 20%							•
2 - Online Quiz(zes) - 20%	•	•	•	•	•	•	
3 - Written Assessment - 30%	•	•					
4 - Written Assessment - 30%			•	•	•	•	

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							•
6 - Information Technology Competence	•	•	•	•	•	•	•
7 - Cross Cultural Competence							
8 - Ethical practice							•
9 - Social Innovation							
10 - First Nations Knowledges							
11 - Aboriginal and Torres Strait Islander Cultures							

Textbooks and Resources

Textbooks

ENAM12003

Prescribed

Fluid Mechanics: Advanced Applications
Edition: 1st (1997)
Authors: Kinsky, Roger
McGraw Hill
Sydney , NSW , Australai
ISBN: 978-007470442-4

ENAM12003

Prescribed

Thermodynamics and Fluids Mechanics - An Introduction
Edition: 1st (1996)
Authors: Kinsky, Roger
McGraw Hill
Sydney , NSW , Australia
ISBN: 978-007470238-3

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

Nur Hassan Unit Coordinator
n.hassan@cqu.edu.au

Schedule

Week 1Fluid properties - 09 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Fluid properties	Textbook 1: Chapter 8	The tutorial questions on fluid properties will be provided on Moodle.

Week 2 Pressure measurement, gas law - 16 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
Lecture: Pressure measurement, gas law	Textbook 1: Chapter 8	The tutorial questions on pressure measurement and the gas law will be provided on Moodle.

Week 3 Fluid statics, Pascal's law, Buoyancy force - 23 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic

Fluid statics, Pascal's law, Buoyancy force	Textbook 1: Chapter 10	The tutorial questions on fluid statics, Pascal's law, and buoyancy force will be provided on Moodle. Quiz 1 opens at 5:00 PM on Friday in Week 3. This assessment will cover the contents of Weeks 1 to 3

Week 4 Fluid flow, flow regime, continuity equation - 30 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
Fluid flow, flow regime, continuity equation	Textbook 1: Chapter 11	The tutorial questions from fluid flow, flow regime, and continuity equationwill be supplied in Moodle Quiz 1 finishes at 5:00 PM on Friday, Week 4.

Week 5 Fluid flow, Bernoulli equation & applications - 06 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic
Fluid flow, Bernoulli equation & applications	Textbook 1: Chapter 11	The tutorial questions on fluid flow, the Bernoulli equation, & applications will be provided on Moodle.

Week 6 Fluid dynamics, Momentum equation & its applications - 13 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic
Fluid dynamics, Momentum equation & its applications	Textbook 1: Chapter 13	The tutorial questions on fluid dynamics, momentum equation & its applications will be provided on Moodle. Written assessment: Assignmnet 1 Due: Week 6 Friday (17 Apr 2026) 11:45 pm AEST

Vacation Week - 20 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic
Non-teaching week	See unit website: Moodle	Non-teaching week

Week 7 Fluid dynamics, jets - 27 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic
Fluid dynamics, jets	Textbook 1: Chapter 13	The tutorial questions on Fluid dynamics, jets, will be provided on Moodle. Quiz-2 Opens at 5:00 PM on Friday, Week 7. This assessment will cover the contents of Week 4 to Week 7

Week 8 Pipe flow, laminar and turbulent flows, head loss. - 04 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
Pipe flow, laminar and turbulent flows, head loss.	Textbook 2: Chapter 2	The tutorial questions on pipe flow, laminar and turbulent flows, and head loss.will be supplied in Moodle. Quiz 2 finishes at 5:00 PM on Friday, Week 8

Week 9 Pipe flow, head loss in pipes & fittings. - 11 May 2026

Module/Topic	Chapter	Events and Submissions/Topic

Pipe flow, head loss in pipes & fittings.	Textbook 2: Chapter 2	The tutorial questions on pipe flow, head loss in pipes & fittings.will be supplied in Moodle.

Week 10 Pipe flow, equivalent length, pipes in series and parallel. - 18 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
Pipe flow, equivalent length, pipes in series and parallel.	Textbook 2: Chapter 2	The tutorial questions on pipe flow, equivalent length, and pipes in series and parallel.will be supplied in Moodle. Quiz 3 opens at 5:00 PM on Friday, Week 11. This assessment will cover the contents of Week 9 to Week 11 Practical and Written Assessment Due: Week 10 Friday (22 May 2026) 10:00 am AEST

Week 11 Fluid machinery, pump performance, specific speed - 25 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
Fluid machinery, pump performance, specific speed	Textbook 2: Chapter 5	The tutorial questions on fluid Machinery, pump Performance, and Specific Speed will be provided on Moodle. Quiz 3 finishes at 5:00 PM on Friday, Week 11. Online Quiz(zes) Due: Week 11 Friday (29 May 2026) 5:00 pm AEST

Week 12 Pumping systems; boundary layer - 01 Jun 2026

Module/Topic	Chapter	Events and Submissions/Topic
Pumping systems; boundary layer	Textbook 2: Chapter 6 & Reference Text; Chapter 7.4 and 11	The tutorial questions on pumping systems and boundary layer will be provided on Moodle. Written assessment: Assignmnet 2 Due: Week 12 Friday (5 June 2026) 11:45 pm AEST

Exam Week - 08 Jun 2026

Module/Topic	Chapter	Events and Submissions/Topic
No final examination	No final examination	No final examination

Vacation/Exam Week - 15 Jun 2026

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Practical and Written Assessment

Assessment Type
Practical and Written Assessment

Task Description
Each student must complete the laboratory exercises per the instruction sheets, which will be available on the unit website. Students will conduct online laboratory sessions during the residential week, as no face-to-face lab activities will take place. These sessions are compulsory, and the laboratory timetable will be supplied separately via the unit website (Moodle).
The following laboratory activities will be conducted by all students:

- Analyse flow properties using fundamental principles and equations of fluid dynamics and fluid properties to determine the head loss and pipe friction.
- Analyse buoyancy and stability of floating bodies and hydrostatic effects of fluids using fundamental principles of fluids.
- Analyse and determine pump characteristics and performance in piping systems.
- Analyse hydrostatic effects of fluids using fundamental principles and properties to determine static pressures and forces.

Assessment Due Date
Week 10 Friday (22 May 2026) 10:00 am AEST

Group submision. Feedback will be provided within 2 weeks after the due date.

Return Date to Students
Week 12 Friday (5 June 2026)

Assignment will be returned after the certification of grade.

Weighting
20%

Minimum mark or grade
You must get a minimum 50% on this assessemnt item to secure a Pass in this unit

Assessment Criteria
Assessment Criteria:
- Clearly outline the key components, such as Theory, Objectives, Procedures, and Results, involved in conducting the laboratory sessions (40% of total marks).
- Ensure clear communication by using correct grammar, spelling, punctuation, and appropriate referencing of sources (10% of total marks)
- Use and present mathematical equations, graphs, tables, diagrams, and/or drawings accurately and correctly (30% of total marks).
- Engage in a thoughtful discussion that logically presents ideas and arguments, utilising data analysis and synthesis. (20% of total marks).

Referencing Style
- Harvard (author-date)

Submission
Online Group

Submission Instructions
Online (Group)

Learning Outcomes Assessed
- Work autonomously and in teams to prepare reports using appropriate engineering language.

2 Online Quiz(zes)

Assessment Type
Online Quiz(zes)

Task Description
This assessment task consists of three "Online Quizzes". First, second, and third carry 7% (Quiz 1 due in week 4 by 5:00 PM AEST), 7% (Quiz 2 due in week 8 by 5:00 PM AEST), and 6% marks (Quiz 3 due in week 11 by 5:00 PM AEST) respectively. Each test consists of numerical, multiple-choice, or true-or-false questions.
Important Notes:
- Each quiz is set to last 60 minutes. You have 60 minutes from the time you begin your attempt to submit your answers. If you start a quiz and then leave it, returning later, your 60-minute timer will continue to run, and you will receive a score of zero for that attempt if the time has expired.
- You can attempt each quiz up to three times within the specified time frame outlined in the schedule.
- The quizzes will automatically close after the allotted time frame ends.
- Your final mark will be based on your highest score from all attempts.
- Although the quizzes will be available over several days, you are expected to make your first attempt on the first day.

- Generally, quizzes cannot be deferred. However, in exceptional circumstances, if you have valid reasons to defer a quiz, please contact the Unit Coordinator with supporting documentation before the due date.

Number of Quizzes
3

Frequency of Quizzes
Other

Assessment Due Date
Week 11 Friday (29 May 2026) 5:00 pm AEST

Tests opening and closing details are given on the the unit shedule and Moodle website..

Return Date to Students

Immediately after the test.

Weighting
20%

Minimum mark or grade
40%

Assessment Criteria
Full marks allocated to a question will be awarded for each correct answer. No partial marks will be allocated.

Referencing Style
- Harvard (author-date)

Submission
Online

Submission Instructions
Online

Learning Outcomes Assessed
- Describe the basic properties of fluids, and the relationship between different fluid properties
- Apply the fundamentals of fluid mechanics to investigate pressure, buoyancy and hydrostatic forces
- Analyse force and power associated with the fluid flow using the continuity, Bernoulli and impulse-momentum equations
- Analyse head loss in pipes, fittings and pipe systems, and determine pump performance (duty point) in piping systems
- Explain the characteristics of fluid machines and select machines suitable for given applications
- Determine drag forces acting on standard shaped objects in fluid flows

3 Written assessment: Assignmnet 1

Assessment Type
Written Assessment

Task Description
This assignment covers the weekly topics from Week 1 to Week 6. Students are required to answer analytical and numerical questions. The assignment tasks will be uploaded on the unit website (Moodle).

Assessment Due Date
Week 6 Friday (17 Apr 2026) 11:45 pm AEST

Submission should be via unit Moodle

Return Date to Students
Week 8 Friday (8 May 2026)

Feedback will be provided within 2 weeks after the due date.

Weighting
30%

Minimum mark or grade
You must get a minimum 50% on this assessemnt item to secure a Pass in this unit

Assessment Criteria
Each question in the assignment will be assessed separately against the following criteria:

- 20% of the total marks are for accuracy and correct result.
- Correct application of maths and arithmetic to the correct answer to the questions.
- Correct use of terminology, units, and conventions.
- 40% for the correct method and procedure.
- Correct selection and application of formula and maths.
- Clear presentation of mathematical and arithmetical calculations for the results obtained.
- Evidence of checking results (mathematical, graphical, etc.).
- 30% for evidence of understanding, Explanation of choices made (why a particular procedure/method is selected).
- Interpretation of results, including limitations, etc., if any.
- Correct and orderly procedures and required steps 10% for a professional presentation.
- Clear identification and statement of each problem.
- Logical layout of analysis.
- Appropriate use of diagrams.

Referencing Style
- Harvard (author-date)

Submission
Online

Submission Instructions
Online

Learning Outcomes Assessed
- Describe the basic properties of fluids, and the relationship between different fluid properties
- Apply the fundamentals of fluid mechanics to investigate pressure, buoyancy and hydrostatic forces

4 Written assessment: Assignmnet 2

Assessment Type
Written Assessment

Task Description
This assignment covers the weekly topics from Week 7 to Week 12. Students are required to answer analytical andnumerical questions. The assignment tasks will be uploaded on the unit website (Moodle).

Assessment Due Date
Week 12 Friday (5 June 2026) 11:45 pm AEST

Submission should be via unit website (Moodle)

Return Date to Students
Exam Week Friday (12 June 2026)

Feedback will be provided within 2 weeks after the due date.

Weighting
30%

Minimum mark or grade
You must get a minimum 50% on this assessemnt item to secure a Pass in this unit

Assessment Criteria
Each question in the assignment will be assessed separately against the following criteria:
- 20% of the total marks are for accuracy and correct result.
- Correct application of maths and arithmetic to the correct answer to the questions.
- Correct use of terminology, units, and conventions.
- 40% for the correct method and procedure.
- Correct selection and application of formula and maths.
- Clear presentation of mathematical and arithmetical calculations for the results obtained.
- Evidence of checking results (mathematical, graphical, etc.).
- 30% for evidence of understanding and Explanation of choices made (why a particular procedure/method is selected).
- Interpretation of results, including limitations, etc., if any.
- Correct and orderly procedures and required steps 10% for a professional presentation.
- Clear identification and statement of each problem.
- Logical layout of analysis.
- Appropriate use of diagrams.

Referencing Style
- Harvard (author-date)

Submission
Online

Submission Instructions
Online via Moodle

Learning Outcomes Assessed
- Analyse force and power associated with the fluid flow using the continuity, Bernoulli and impulse-momentum equations
- Analyse head loss in pipes, fittings and pipe systems, and determine pump performance (duty point) in piping systems
- Explain the characteristics of fluid machines and select machines suitable for given applications
- Determine drag forces acting on standard shaped objects in fluid flows

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