



ENAM12003 *Engineering Fluids*

Term 2 - 2017

Profile information current as at 27/04/2024 10:38 am

All details in this unit profile for ENAM12003 have been officially approved by CQU University 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 students to key concepts and principles required to analyse problems involving engineering fluids. They 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. Students 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. They will be able to prepare technical and laboratory reports that demonstrate critical evaluation of results and experimental uncertainties. Students are required to show they work productively, both individually and collaboratively, to solve problems, and document and communicate their work clearly in a professional manner. 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

Prereq: 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 2 - 2017

- Distance

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. **Practical and Written Assessment**

Weighting: 20%

2. **Written Assessment**

Weighting: 25%

3. **Written Assessment**

Weighting: 25%

4. **Written Assessment**

Weighting: 30%

5. **Written Assessment**

Weighting: Pass/Fail

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 Moodle Formal Feedback

Feedback

The residential school were well set-up and helpful in furthering students knowledge.

Recommendation

Students indicated that the practical examples and activities during the residential school were helpful in furthering their knowledge. The practice will continue in the future offering.

Feedback from Moodle Formal Feedback

Feedback

The syllabus was broken down into manageable topics with a clear outline of expectations.

Recommendation

Students found the course enjoyable with a clear outline of expectations. The practice will continue in the future offering.

Feedback from Staff Reflection and Moodle Formal Feedback

Feedback

There was a slight delay in returning an assessment item due to malfunctioning of the newly adopted marking software 'remark'.

Recommendation

Steps will be undertaken to avoid any technical glitch in the marking software so that there is no delay in returning the assessment item.

Unit Learning Outcomes

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

1. Describe the basic properties of fluids, and explain how these properties relate to one another. [1,3]
2. Explain the basic concepts and principles of fluid statics and apply these principles to determine static fluid pressure and forces. [1,3,4]
3. Analyse flows and determine force and power associated with fluid flow using the continuity, Bernoulli and impulse-momentum equations. [1,3,4,5]
4. Analyse and determine head loss in pipes, fittings and pipe systems, and determine pump performance (duty point) in piping systems. [1,3,4,5]
5. Explain the basic types and characteristics of fluid machines and select machines suitable for given applications. [1,2,3,4,5]
6. Determine drag forces acting on standard shaped objects in fluid flows. [1,3,4]
7. Prepare technical and laboratory reports with professional evaluation of experimental uncertainties and results obtained. [2,3,4,5,9]
8. Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development. [2,6,9,10]
9. Formulate and solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems. [2,4,9]

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes								
	1	2	3	4	5	6	7	8	9
1 - Practical and Written Assessment - 20%	•	•	•	•	•	•	•	•	•
2 - Written Assessment - 25%	•	•	•	•	•	•	•	•	•
3 - Written Assessment - 25%				•					
4 - Written Assessment - 30%					•	•	•	•	•
5 - Written Assessment - 0%	•	•	•	•	•	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes								
	1	2	3	4	5	6	7	8	9
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 - Practical and Written Assessment - 20%	•	•	•		•			•		
2 - Written Assessment - 25%	•	•	•					•		
3 - Written Assessment - 25%	•	•	•					•		

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
4 - Written Assessment - 30%	•	•	•					•		

Textbooks and Resources

Textbooks

ENAM12003

Prescribed

Fluid Mechanics: Advanced Applications

Edition: 1st edn (1997)

Authors: Kinsky, R

McGraw Hill

Maidenhead , Berkshire , UK

Binding: Paperback

ENAM12003

Prescribed

Introductory Thermodynamics and Fluids Mechanics

(1996)

Authors: Kinsky, R

McGraw Hill

Maidenhead , Berkshire , UK

Binding: Hardcover

[View textbooks at the CQUniversity Bookshop](#)

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

Ashfaque Chowdhury Unit Coordinator

a.chowdhury@cqu.edu.au

Schedule

Week 1 - 10 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Fluid property	Text 1: Chapter 8	

Week 2 - 17 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Laboratory Reports

Assessment Type

Practical and Written Assessment

Task Description

Each student will be required to complete the laboratory exercises as per the instruction sheets which will be available in 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 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 and if required, or as directed by the lecturer or technical officer-in-charge. All requirements of the Faculty 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 laboratory session:

Arrive early; communicate with other members of the groups and be ready for the laboratory experiment.

Ensure to bring:

Laboratory instruction sheets if any;

Graph paper (A4 linear, 10 div/cm);

Notebook (A4 hard bound);

Ruler (30 cm clear plastic);

Pen & pencil;

Scientific calculator;

Correct footwear.

Students are expected to complete the entire laboratory exercise including the drawing of graphs and calculating the final answer. All raw data must be entered in 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 item details.

Assessment Due Date

Review/Exam Week Friday (13 Oct 2017) 11:45 pm AEST

Return Date to Students

It is expected that assignment will be returned in 2 weeks after the due date.

Weighting

20%

Minimum mark or grade

You must get a minimum 50% on this assessment item to secure a Pass in this unit

Assessment Criteria

- Reporting of major elements/steps (eg. 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).

total marks).

Referencing Style

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

Submission

Online Group

Submission Instructions

Submission should be via unit website (Moodle)

Learning Outcomes Assessed

- Describe the basic properties of fluids, and explain how these properties relate to one another. [1,3]
- Explain the basic concepts and principles of fluid statics and apply these principles to determine static fluid pressure and forces. [1,3,4]
- Analyse flows and determine force and power associated with fluid flow using the continuity, Bernoulli and impulse-momentum equations. [1,3,4,5]
- Analyse and determine head loss in pipes, fittings and pipe systems, and determine pump performance (duty point) in piping systems. [1,3,4,5]
- Explain the basic types and characteristics of fluid machines and select machines suitable for given applications. [1,2,3,4,5]
- Determine drag forces acting on standard shaped objects in fluid flows. [1,3,4]
- Prepare technical and laboratory reports with professional evaluation of experimental uncertainties and results obtained. [2,3,4,5,9]
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development. [2,6,9,10]
- Formulate and solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems. [2,4,9]

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Team Work
- Ethical practice

2 Assignment 1

Assessment Type

Written Assessment

Task Description

This assignment covers the weekly topics from Week 1 to Week 4. Students are required to answer analytical and numerical questions. The assignment tasks will be uploaded on the unit website (Moodle).

Assessment Due Date

Week 5 Friday (11 Aug 2017) 11:45 pm AEST

Return Date to Students

It is expected that assignment will be returned in 2 weeks after the due date.

Weighting

25%

Minimum mark or grade

You must get a minimum 50% on this assessment item to secure a Pass in this unit

Assessment Criteria

Each question in the assignment will be assessed separately against the following criterion:

20% of the total marks are for accuracy and correct result

Correct application of maths and arithmetic

Correct answer to the questions

Correct use of terminology, units and conventions

40% for 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 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

Submission should be via unit website (Moodle)

Learning Outcomes Assessed

- Describe the basic properties of fluids, and explain how these properties relate to one another. [1,3]
- Explain the basic concepts and principles of fluid statics and apply these principles to determine static fluid pressure and forces. [1,3,4]
- Analyse flows and determine force and power associated with fluid flow using the continuity, Bernoulli and impulse-momentum equations. [1,3,4,5]
- Analyse and determine head loss in pipes, fittings and pipe systems, and determine pump performance (duty point) in piping systems. [1,3,4,5]
- Explain the basic types and characteristics of fluid machines and select machines suitable for given applications. [1,2,3,4,5]
- Determine drag forces acting on standard shaped objects in fluid flows. [1,3,4]
- Prepare technical and laboratory reports with professional evaluation of experimental uncertainties and results obtained. [2,3,4,5,9]
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development. [2,6,9,10]
- Formulate and solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems. [2,4,9]

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Ethical practice

3 Assignment 2

Assessment Type

Written Assessment

Task Description

This assignment covers the weekly topics from Week 5 to Week 8. Students are required to answer analytical and numerical questions. The assignment tasks will be uploaded on the unit website (Moodle).

Assessment Due Date

Week 8 Friday (8 Sept 2017) 11:45 pm AEST

Return Date to Students

It is expected that assignment will be returned in 2 weeks after the due date.

Weighting

25%

Minimum mark or grade

You must get a minimum 50% on this assessment item to secure a Pass in this unit

Assessment Criteria

Each question in the assignment will be assessed separately against the following criterion:

20% of the total marks are for accuracy and correct result
Correct application of maths and arithmetic
Correct answer to the questions
Correct use of terminology, units and conventions
40% for 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 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

Submission should be via unit website (Moodle)

Learning Outcomes Assessed

- Analyse and determine head loss in pipes, fittings and pipe systems, and determine pump performance (duty point) in piping systems. [1,3,4,5]

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Ethical practice

4 Assignment 3

Assessment Type

Written Assessment

Task Description

This assignment covers the weekly topics from Week 9 to Week 12. Students are required to answer analytical and numerical questions. The assignment tasks will be uploaded on the unit website (Moodle).

Assessment Due Date

Week 12 Friday (6 Oct 2017) 11:45 pm AEST

Return Date to Students

It is expected that assignment will be returned in 2 weeks after the due date.

Weighting

30%

Minimum mark or grade

You must get a minimum 50% on this assessment item to secure a Pass in this unit

Assessment Criteria

Each question in the assignment will be assessed separately against the following criterion:

20% of the total marks are for accuracy and correct result
Correct application of maths and arithmetic
Correct answer to the questions
Correct use of terminology, units and conventions
40% for 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 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

Submission should be via unit website (Moodle)

Learning Outcomes Assessed

- Explain the basic types and characteristics of fluid machines and select machines suitable for given applications. [1,2,3,4,5]
- Determine drag forces acting on standard shaped objects in fluid flows. [1,3,4]
- Prepare technical and laboratory reports with professional evaluation of experimental uncertainties and results obtained. [2,3,4,5,9]
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development. [2,6,9,10]
- Formulate and solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems. [2,4,9]

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Ethical practice

5 Workbook

Assessment Type

Written Assessment

Task Description

The Workbook provides a record or detailed diary of each individual student's study and learning activities throughout the course. It should include all individual work and activities.

Maintaining a Workbook is viewed as a sound study technique. It is intended to provide an evidence if students have adequately studied the whole unit and achieved unit learning outcomes. The Workbook can be handwritten or kept as a text file. Each entry should be dated and pages should be numbered with student name or initials. It should be prepared week by week, not at the end of the Term. It should contain your attempts at problems including failures and fixes, brainstorming, draft notes and developing ideas.

A typical Workbook should record:

- study notes taken while studying textbooks and course resources
- study notes taken during lectures and/or workshops
- personal study summaries of key concepts
- notes, sketches/ drawings or mind-maps
- planning and preparation for team/project tasks
- planning and preparation for online course discussions
- workbook practice tasks you are asked to complete in the Course Website
- initial attempts at set tutorial tasks
- initial attempts at assignment tasks
- preparation for class tests or exams.

Assessment Due Date

Exam Week Monday (16 Oct 2017) 11:45 pm AEST

Return Date to Students

It is expected that assignment will be returned in 2 weeks after the due date.

Weighting

Pass/Fail

Minimum mark or grade

Pass

Assessment Criteria

Workbook questions have been set for each topic and are available on the unit website. If students have difficulty with Workbook questions, they should seek assistance. All questions must be successfully completed in the workbook and responses must show sufficient working and explanation to allow step-by-step checking by tutors. At least 50% of the questions must be completed to achieve a Pass grade.

A question will be deemed to have been completed if the student has shown correct procedure and sound understanding of the work. All calculations should be justified with reference to the text or relevant Standards and Codes.

Referencing Style

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

Submission

Online

Submission Instructions

Submission should be via unit website (Moodle)

Learning Outcomes Assessed

- Describe the basic properties of fluids, and explain how these properties relate to one another. [1,3]
- Explain the basic concepts and principles of fluid statics and apply these principles to determine static fluid pressure and forces. [1,3,4]
- Analyse flows and determine force and power associated with fluid flow using the continuity, Bernoulli and impulse-momentum equations. [1,3,4,5]
- Analyse and determine head loss in pipes, fittings and pipe systems, and determine pump performance (duty point) in piping systems. [1,3,4,5]
- Explain the basic types and characteristics of fluid machines and select machines suitable for given applications. [1,2,3,4,5]
- Determine drag forces acting on standard shaped objects in fluid flows. [1,3,4]
- Prepare technical and laboratory reports with professional evaluation of experimental uncertainties and results obtained. [2,3,4,5,9]
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development. [2,6,9,10]
- Formulate and solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems. [2,4,9]

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