ENTM12006 *Industrial Fluid Power*
Term 1 - 2020

Profile information current as at 02/05/2024 06:32 pm

General Information

Overview
Students develop a working knowledge of the principles and applications of fluid power in industry. They use technical fluid power terminology and representations and select and size fluid power system components, design pressure controls and circuit protection, and recommend and draw simple circuit designs. They outline measures taken to maintain circuit sustainability; develop skills to work, learn and communicate professionally, to investigate and solve problems, and clearly communicate their designs and problem solutions and their rationale for solving problems. Distance education (FLEX) students are required to have access to a computer and to make frequent use of the Internet

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: ENAG11002 Energy & Electricity or ENEG11009 Fundamentals of Energy & Electricity or PHYS11185 Engineering Physics B
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

- 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. **Written Assessment**
Weighting: 30%
2. **Written Assessment**
Weighting: 40%
3. **Written Assessment**
Weighting: 30%
4. **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 Feedback

Feedback
The unit was well structured and provided the necessary knowledge to complete the assessment items.

Recommendation
Clear and concise study guide correlating with the textbook provided. The practice will continue.

Feedback from Moodle Feedback

Feedback
Assessment return.

Recommendation
The return timeframe will be prioritised to avoid any clash with a subsequent assessment item.

Unit Learning Outcomes

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

1. Explain the nature and principles of 'fluid power' and fluid power systems and describe the behaviour of common working fluids in such systems [1,2,3,4,5]
2. Use and interpret technical terminology, symbols and representations used to describe fluid power systems, components and installations [1,2,3]
3. Select and size fluid power circuit components to achieve circuit control objectives [3, 4, 5]
4. Design suitable pressure controls to protect circuit components and to minimise energy loss. [1,3,4,5]
5. Explain the factors influencing sustainable operation of fluid power systems and measures taken to maintain circuit sustainability [1,3,4,5, 8]
6. Recommend suitable circuit designs for simple hydraulic and pneumatic systems [1,2,3,4,5,8]
7. Design and draw simple pneumatic/hydraulic systems [1,2,3,4,5]
8. Work, learn and communicate in an ethical, professional manner individually and collaboratively, using information literacy skills to investigate problems and present solutions [2, 4, 6, 9, 10]
9. 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, 10]

Bracketed numbers show Graduate Attributes below aligned with by each Learning Outcome above.
BEng Graduate Attributes

1. science and engineering
2. communicate effectively
3. technical competence
4. problem solution
5. systems approach
6. function in teams
7. social, cultural, global and environmental
8. sustainable design and development
9. professionalism and ethics
10.lifelong learning

ADEng Graduate Attributes

1. science and engineering
2. communicate effectively
3. technical support competence
4. simple problem resolution
5. standards and codes of practice
6. function as a team member
7. social, cultural, global and environmental
8. sustainable design and development
9. professionalism and ethics
10. lifelong learning

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	8	9
1 - Written Assessment - 30%	•	•	•					•	•

Assessment Tasks	Learning Outcomes								
	1	2	3	4	5	6	7	8	9
2 - Written Assessment - 40%			•	•	•			•	•
3 - Written Assessment - 30%					•	•	•	•	•
4 - 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 - Written Assessment - 30%	•	•	•	•		•		•		
2 - Written Assessment - 40%	•	•	•	•		•		•		
3 - Written Assessment - 30%	•	•	•	•		•		•		
4 - Written Assessment - 0%	•	•	•	•		•		•		

Textbooks and Resources

Textbooks

ENTM12006

Prescribed

Fluid Power with Applications
7th edn (New International Edition) (2014)
Authors: Anthony Esposito
Pearson
Upper Saddle River , NJ , Australia
ISBN: 9781292023878
Binding: Paperback
ENTM12006

Supplementary

Introduction to Fluid Power
Edition: 1st edn (2001)
Authors: James Johnson
Delmar Cengage Learning
Clifton Park , NY , USA
ISBN: 9780766823655
Binding: Hardcover

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

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Hardware to access audio-visual clips

Referencing Style

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

Teaching Contacts

Abdul Mazid Unit Coordinator
a.mazid@cqu.edu.au

Schedule

Week 1 - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Fluid Properties	2	No tutorial

Week 2 - 16 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Hydraulic Pumps	5	Tutorial on Fluid Properties via Zoom

Week 3 - 23 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Hydraulic Motors	7	Tutorial on Hydraulic Pumps via Zoom

Week 4 - 30 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Actuators and Cushioning	6	Tutorial on Hydraulic Motors via Zoom

Week 5 - 06 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Hydraulic Valves	8	Tutorial on Actuator Selection via Zoom. **Assignment One** Due: Week 5 Friday (10 Apr 2020) 11:45 pm AEST

Vacation Week - 13 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
		Revisit all learning materials delivered during Weeks 1 to 5. Consultation on request via Zoom.

Week 6 - 20 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Fluid Control Circuit Design	9 and 14	Tutorial on design and working principles of valves via Zoom.

Week 7 - 27 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Electric Circuits in Fluid Control Systems	15	Tutorial on Fluid Control Circuit Design via Zoom.

Week 8 - 04 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Pneumatic Control Elements	14 and Handout	Tutorial and exercises on Integrated Electric-Fluid Control Circuits via Zoom.

Week 9 - 11 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Pneumatic Logic Elements	16 and Handout	Tutorial on design and working principles of Pneumatic Control Elements via Zoom. **Assignment Two** Due: Week 9 Friday (15 May 2020) 11:45 pm AEST

Week 10 - 18 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
PLC Architecture and Programming	17 and Handout	Tutorial on design and working principles of Pneumatic Logic Elements via Zoom.

Week 11 - 25 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Pneumatic Sensors	Handout Materials	Tutorial on examples of PLC programs for Pneumatic Control Systems via Zoom.

Week 12 - 01 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic

		Tutorial on design and working principles of Pneumatic Sensors via Zoom.
Maintenance of Fluid Systems	12	**Assignment Three** Due: Week 12 Friday (5 June 2020) 11:45 pm AEST **Workbook** Due: Week 12 Friday (5 June 2020) 11:45 pm AEST
Review/Exam Week - 08 Jun 2020		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Exam Week - 15 Jun 2020		
Module/Topic	**Chapter**	**Events and Submissions/Topic**

Term Specific Information

Residential School for two days has been proposed and waiting for approval. Once it is approved students will be informed and the Unit Profile will be amended. Students are supposed to attend a Residential School for two days on Melbourne Campus. Main activities in Residential School are performing 6 Lab experiments on hydraulic and fluid control. Students will gain essential hands-on skills in industrial control and automation systems.
Accordingly Assessment items also will be amended and adjusted.

Assessment Tasks

1 Assignment One

Assessment Type
Written Assessment

Task Description
Assignment 1 involves problem solving and analysis of hydraulic drive and control systems of industrial machines. This assignment covers learning materials for Weeks 1 to 4. This may involve fluid system circuit design for a selected industrial automated or semi-automated machine.

Assessment Due Date
Week 5 Friday (10 Apr 2020) 11:45 pm AEST

Return Date to Students
Week 7 Monday (27 Apr 2020)

Weighting
30%

Minimum mark or grade
50%

Assessment Criteria
Each question in this assignment will be assessed separately for the criterion accuracy and correct results.
20% of the total marks for this assignment are based on accuracy and correct results, including:

- Correct application of maths and arithmetic
- Accuracy and quality of hydraulic circuit
- Answers clearly identified
- Correct results

In addition, the assignment, as a whole, will be assessed against the following criteria:
Evidence of correct procedures (40% of the total marks for the assignment)

- All necessary steps in analysis are present on correct order
- Clear presentation of mathematical and arithmetical working linking given details of the problem to the results obtained.

Evidence of understanding of the topic (30% of the total marks for the assignment)

- Explanation of choices made in the analysis
- Interpretation of results, eg limitations etc, if any.

Professional presentation (10% of the total marks for the assignment)

- The problem is clearly identified
- Clear statement of each problem and its details and requirements
- Logical layout of analysis
- Appropriate use of diagrams and ISO standard, units, neatness of diagrams
- Correct use of terminology and conventions

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
It is not expected that students will type up calculations. Students should scan hand calculations for online submission.

Learning Outcomes Assessed

- Explain the nature and principles of 'fluid power' and fluid power systems and describe the behaviour of common working fluids in such systems [1,2,3,4,5]
- Use and interpret technical terminology, symbols and representations used to describe fluid power systems, components and installations [1,2,3]
- Select and size fluid power circuit components to achieve circuit control objectives [3, 4, 5]
- Work, learn and communicate in an ethical, professional manner individually and collaboratively, using information literacy skills to investigate problems and present solutions [2, 4, 6, 9, 10]
- 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, 10]

Graduate Attributes

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

2 Assignment Two

Assessment Type
Written Assessment

Task Description
The assignment covers the weekly topics 5-8. The assignment tasks and questions will be uploaded on the course website by the end of week 5. In this assessment item, students are required to answer problem solving and numerical questions. Hydraulic / pneumatic circuit design for an industrial machine may be other part of this assignment.

Assessment Due Date
Week 9 Friday (15 May 2020) 11:45 pm AEST

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

Weighting
40%

Minimum mark or grade
50%

Assessment Criteria
Each question in this assignment will be assessed separately for the criterion accuracy and correct results.
20% of the total marks for this assignment are based on accuracy and correct results, including:

- Correct application of maths and arithmetic
- Presenting functional and accurate control circuit for automated or semi-automated industrial machine
- Answers clearly identified

- Use of relevant ISO standard
- Correct results

In addition, the assignment, as a whole, will be assessed against the following criteria:
Evidence of correct procedures (40% of the total marks for the assignment)

- All necessary steps in analysis are present on correct order
- Clear presentation of mathematical and arithmetical working linking given details of the problem to the results obtained.

Evidence of understanding of the topic (30% of the total marks for the assignment)

- Explanation of choices made in the analysis
- Interpretation of results, eg limitations etc, if any.

Professional presentation (10% of the total marks for the assignment)

- The problem is clearly identified
- Clear statement of each problem and its details and requirements
- Logical layout of analysis
- Appropriate use of diagrams, units, clear diagrams
- Correct use of terminology, ISO symbols and conventions

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
It is not expected that students will type up calculations. Students should scan hand calculations for online submission.

Learning Outcomes Assessed

- Select and size fluid power circuit components to achieve circuit control objectives [3, 4, 5]
- Design suitable pressure controls to protect circuit components and to minimise energy loss. [1,3,4,5]
- Explain the factors influencing sustainable operation of fluid power systems and measures taken to maintain circuit sustainability [1,3,4,5, 8]
- Work, learn and communicate in an ethical, professional manner individually and collaboratively, using information literacy skills to investigate problems and present solutions [2, 4, 6, 9, 10]
- 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, 10]

Graduate Attributes

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

3 Assignment Three

Assessment Type
Written Assessment

Task Description
The assignment covers the weekly topics 9-11. The assignment tasks and questions will be uploaded on the course website by the end of week 9. In this assessment item, students are required to answer problem solving and numerical questions. Fluid control circuit for automated or semi-automated industrial machine may be another portion of the assignment.

Assessment Due Date
Week 12 Friday (5 June 2020) 11:45 pm AEST

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

Weighting
30%

Minimum mark or grade
50%

Assessment Criteria
Each question in this assignment will be assessed separately for the criterion accuracy and correct results.
20% of the total marks for this assignment are based on accuracy and correct results, including:

- Correct application of maths and arithmetic
- Answers clearly identified
- Effectiveness and functional fluid control circuit including PLC program
- Correct results

In addition, the assignment, as a whole, will be assessed against the following criteria:
Evidence of correct procedures (40% of the total marks for the assignment)

- All necessary steps in analysis are present on correct order
- Clear presentation of mathematical and arithmetical working linking given details of the problem to the results obtained.

Evidence of understanding of the topic (30% of the total marks for the assignment)

- Explanation of choices made in the analysis
- Interpretation of results, eg limitations etc, if any.

Professional presentation (10% of the total marks for the assignment)

- The problem is clearly identified
- Clear statement of each problem and its details and requirements
- Logical layout of analysis
- Appropriate use of diagrams, units, clear diagrams using ISO symbols
- Correct use of terminology and conventions

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
It is not expected that students will type up calculations. Students should scan hand calculations for online submission.

Learning Outcomes Assessed

- Explain the factors influencing sustainable operation of fluid power systems and measures taken to maintain circuit sustainability [1,3,4,5, 8]
- Recommend suitable circuit designs for simple hydraulic and pneumatic systems [1,2,3,4,5,8]
- Design and draw simple pneumatic/hydraulic systems [1,2,3,4,5]
- Work, learn and communicate in an ethical, professional manner individually and collaboratively, using information literacy skills to investigate problems and present solutions [2, 4, 6, 9, 10]
- 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, 10]

Graduate Attributes

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

4 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 and should include all individual work carried out. Preparation of a Workbook should be understood as good study technique. It also provides evidence that students have adequately studied the whole course and achieved course learning outcomes. Each entry should be dated, pages should be numbered and show your name or initials. It should be prepared week by week, not at the end of term. Show rough attempts at problems including failures and fixes, brainstorming, draft notes and developing ideas. In the Workbook students 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
Week 12 Friday (5 June 2020) 11:45 pm AEST

Return Date to Students
Exam Week Friday (19 June 2020)

Weighting
Pass/Fail

Minimum mark or grade
50%

Assessment Criteria
Workbook questions will be set for each topic and will be available on the Course 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 the marker. At least 50% of the questions must be completed to achieve a passing 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
It is not expected that students will type up calculations. Students should scan hand calculations for online submission.

Learning Outcomes Assessed

- Explain the nature and principles of 'fluid power' and fluid power systems and describe the behaviour of common working fluids in such systems [1,2,3,4,5]
- Use and interpret technical terminology, symbols and representations used to describe fluid power systems, components and installations [1,2,3]
- Select and size fluid power circuit components to achieve circuit control objectives [3, 4, 5]
- Design suitable pressure controls to protect circuit components and to minimise energy loss. [1,3,4,5]
- Explain the factors influencing sustainable operation of fluid power systems and measures taken to maintain circuit sustainability [1,3,4,5, 8]
- Recommend suitable circuit designs for simple hydraulic and pneumatic systems [1,2,3,4,5,8]
- Design and draw simple pneumatic/hydraulic systems [1,2,3,4,5]
- Work, learn and communicate in an ethical, professional manner individually and collaboratively, using information literacy skills to investigate problems and present solutions [2, 4, 6, 9, 10]
- 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, 10]

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