



ENAM12006 *Mechanical Component Selection*

Term 2 - 2017

Profile information current as at 04/05/2024 12:01 pm

All details in this unit profile for ENAM12006 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

Students select and specify common mechanical engineering components like drive line components, bearings and fasteners. They determine requirements for components, research to find information to guide selection, select and size components, and specify the selected components. They select fasteners and indicate fits, tolerances and finishes required for mechanical components. Students describe the roles and responsibilities of members of engineering teams and develop skills required to work and learn independently and collaboratively, and to solve problems and present solutions. Distance education (FLEX) students are required to have access to a computer and 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

(ENAG11005 Mechanics or ENEG11006 Engineering Statics) and MATH11160 Technology Mathematics or MATH11218 Eng Foundation 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).

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: 50%

2. **Written Assessment**

Weighting: 50%

3. **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 'Have your say' course evaluation survey

Feedback

It is easier using study guide to navigate and get relevant information on a topic. The book topics were clearly stated

Recommendation

This practice will be continued.

Feedback from 'Have your say' course evaluation survey

Feedback

The course should have more than 2 assignments and they should be equally spaced out.

Recommendation

There are 3 assessments in this course which includes two assignments and a workbook. There are evenly spread now. Room for improvement for these tasks are to be explored.

Unit Learning Outcomes

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

1. Determine requirements for components in mechanical assemblies and systems from design notes, related sources of information and from analysis of performance and purpose
2. Research and obtain information required to select components
3. Select and size components and explain the basis for selections
4. Specify selected components using terminology relating to mechanical component selection
5. Select fasteners for given applications and explain reasons for the selection
6. Describe and explain methods of indicating fits, finishes and tolerances, and apply these to component selection
7. Describe the roles and responsibilities of members of engineering teams and the procedures used to maintain safety and quality in design, production and operation
8. Work and learn collaboratively and professionally to investigate and solve open ended problems, check work and present solutions

The learning Outcomes for this Unit are linked to Engineers Australia stage one competency standards for Engineering Associates.

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
1 - Written Assessment - 50%	•	•	•	•	•		•	•
2 - Written Assessment - 50%	•	•	•	•		•		•
3 - Written Assessment - 0%	•	•	•	•	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes							
	1	2	3	4	5	6	7	8
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 - 50%	•	•	•	•		•		•		
2 - Written Assessment - 50%	•	•	•	•		•		•		
3 - Written Assessment - 0%	•	•		•	•	•		•		

Textbooks and Resources

Textbooks

ENAM12006

Prescribed

Fundamentals of Machine Components

Edition: 5th edn (2011)

Authors: Juvinall, R & Marshek, K

Wiley Publishers

Englewood Cliffs , NJ , USA

Binding: Paperback

ENAM12006

Prescribed

Mechanical Design

Edition: Second (2004)

Authors: Peter R.N. Childs

Elsevier

US

Binding: Paperback

ENAM12006

Supplementary

Shigley's mechanical engineering design (SI units)

Edition: 9th edn (2011)

Authors: Budynas, R & Nisbett, R

McGraw Hill Education

New York , NY , USA

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)
- 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

Ramadas Narayanan Unit Coordinator

r.narayanan@cqu.edu.au

Schedule

Week 1 - 10 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
--------------	---------	------------------------------

Threaded Fasteners

Textbook : Mechanical Design by Peter N Childs
Chapter 12 Sections 12.1 - 12.2
See the study guide given in the unit website
Tutorial : Example 12.1 & 12.2

Week 2 - 17 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Principles of Fasteners Design	Textbook : Mechanical Design by Peter N Childs Chapter 12 Sections 12.3 See the study guide given in the unit website Tutorial: Example 12.3	

Week 3 - 24 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Design of Chain Drive : Chain & Sprocket	Textbook: Mechanical Design by Peter N Childs Chapter 8 Section 8.3 See the study guide given in the unit website Tutorial: Example 8.3	

Week 4 - 31 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Coupling & Clutches: Applications and Design Principles	Textbook : Mechanical Design by Peter N Childs Chapter 10 Sections 10.1 - 10.3 See the study guide given in the unit website Tutorial: Examples 10.1 - 10.4 & 10.8	

Week 5 - 07 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Welded Joints	Textbook: Mechanical Design by Peter N Childs Chapter 12 Sections 12.6 12.8 See the study guide given in the unit website	

Vacation Week - 14 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Vacation Week		Assignment 1 Due: Vacation Week Friday (18 Aug 2017) 11:45 pm AEST

Week 6 - 21 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Safety Features in Machine Design	See unit website	

Week 7 - 28 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Fits and Tolerances	Textbook: Mechanical Design by Peter N Childs Chapter 15 Sections 15.1 - 15.2 See the study guide given in the unit website Tutorial: Examples 15.1 - 15.3	

Week 8 - 04 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic

Shaft and Axles: Shaft Design, Principles and Purposes

Textbook: Mechanical Design by Peter N Childs & .
Chapter 5 Sections 5.1 - 5.6
Fundamentals of Machine Component Design by R.C Juvinall & K.M Marshek.(See the study guide given in the unit website)
Tutorial: Examples 5.1 - 5.2 & 5.5

Week 9 - 11 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Spring Design Consideration	Textbook: Mechanical Design by Peter N Childs Chapter 11 Sections 11.1 - 11.3 See the study guide given in the unit website Tutorial: Examples 11.1 - 11.3	

Week 10 - 18 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Bearing Selection and their Applications	Textbook: Mechanical Design by Peter N Childs Chapter 4 Sections 4.1 - 4.4 See the study guide given in the unit website Tutorial: Examples 4.1 - 4.6	

Week 11 - 25 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Drive Systems : Gears and Keys	Textbook: Mechanical Design by Peter N Childs Chapter 6 Sections 6.1 - 6.7 Fundamentals of Machine Component Design by R.C Juvinall & K.M Marshek.(See the study guide given in the unit website Tutorial: Examples 6.1 - 6.7	

Week 12 - 02 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
Belt Drive Design : Belt and Pulleys	Textbook: Mechanical Design by Peter N Childs Chapter 8 Sections 8.1- 8.2 See the study guide given in the unit website Tutorial: Examples 8.1- 8.2	

Review/Exam Week - 09 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
		Assignment 2 Due: Review/Exam Week Friday (13 Oct 2017) 11:45 pm AEST

Exam Week - 16 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
		Workbook Due: Exam Week Friday (20 Oct 2017) 11:45 pm AEST

Assessment Tasks

1 Assignment 1

Assessment Type

Written Assessment

Task Description

The assignment covers the weekly topics up to week 5. The assignment tasks and questions will be uploaded on the unit website. In this assessment item, students are required to answer problem-solving and numerical questions.

Assessment Due Date

Vacation Week Friday (18 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

50%

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
- 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 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

- Determine requirements for components in mechanical assemblies and systems from design notes, related sources of information and from analysis of performance and purpose
- Research and obtain information required to select components
- Select and size components and explain the basis for selections
- Specify selected components using terminology relating to mechanical component selection
- Select fasteners for given applications and explain reasons for the selection
- Describe the roles and responsibilities of members of engineering teams and the procedures used to maintain safety and quality in design, production and operation
- Work and learn collaboratively and professionally to investigate and solve open ended problems, check work and

present solutions

Graduate Attributes

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

2 Assignment 2

Assessment Type

Written Assessment

Task Description

The assignment covers the topics of weeks 6 to 12. The assignment tasks and questions will be uploaded on the unit website. In this assessment item, students are required to answer problem-solving and numerical questions.

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 2 weeks after the due date.

Weighting

50%

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
- 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 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

- Determine requirements for components in mechanical assemblies and systems from design notes, related sources of information and from analysis of performance and purpose
- Research and obtain information required to select components
- Select and size components and explain the basis for selections
- Specify selected components using terminology relating to mechanical component selection
- Describe and explain methods of indicating fits, finishes and tolerances, and apply these to component selection
- Work and learn collaboratively and professionally to investigate and solve open ended problems, check work and present solutions

Graduate Attributes

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

3 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 unit 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 unit and achieved unit 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 unit 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 unit discussions
- workbook practice tasks you are asked to complete in the Unit Website
- initial attempts at set tutorial tasks
- initial attempts at assignment tasks
- preparation for class tests or exams.

Assessment Due Date

Exam Week Friday (20 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

To pass this unit you must submit all assessment items and obtain an overall grade of at least 50% in each assessment item.

Assessment Criteria

Workbook questions will be set for each topic and will be 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 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

- Determine requirements for components in mechanical assemblies and systems from design notes, related sources of information and from analysis of performance and purpose
- Research and obtain information required to select components
- Select and size components and explain the basis for selections
- Specify selected components using terminology relating to mechanical component selection
- Select fasteners for given applications and explain reasons for the selection
- Describe and explain methods of indicating fits, finishes and tolerances, and apply these to component selection
- Describe the roles and responsibilities of members of engineering teams and the procedures used to maintain safety and quality in design, production and operation
- Work and learn collaboratively and professionally to investigate and solve open ended problems, check work and present solutions

Graduate Attributes

- Communication
- Problem Solving
- Information Literacy
- Team Work
- 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