



# ENAM12006 *Mechanical Component Selection*

## Term 2 - 2018

Profile information current as at 06/05/2024 04:07 am

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 - 2018

- 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 Course evaluation survey

##### Feedback

The unit content was very interesting.

##### Recommendation

The content will be kept same for the future offerings.

#### Feedback from Discussion session

##### Feedback

Assessment tasks were very clear.

##### Recommendation

This practice will be continued.

## 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



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
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

##### Mechanical Design

Edition: 2nd (2004)

Authors: Childs, PRN

Elsevier Butterworth-Heinemann

Oxford , UK

ISBN: 9780750657716

Binding: Paperback

[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 styles below:**

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

For further information, see the Assessment Tasks.

## Teaching Contacts

**Prasad Gudimetla** Unit Coordinator

[p.gudimetla@cqu.edu.au](mailto:p.gudimetla@cqu.edu.au)

## Schedule

### Week 1 - 09 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
1. Introduction to Mechanical Component Selection	Lecture Notes Reading: Childs, Chapters 1, 2, 16	
2. Overview of Machine Elements		
3. The Role of Materials in Component Selection		

### Week 2 - 16 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
1. Loads & Stresses in Machine Elements	Lecture Notes Reading: Childs, Chapter 3	
2. Static Load Analysis		
3. Variable Loading Analysis		

### Week 3 - 23 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
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- |                                   |                            |
|-----------------------------------|----------------------------|
| 1. Design and Selection of Shafts | Lecture Notes              |
| 2. Limits, Fits and Tolerances    | Reading: Childs, Chapter 5 |

#### Week 4 - 30 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design and Selection of Roller Bearings	Lecture Notes Reading: Childs, Chapter 4	

#### Week 5 - 06 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Gears - Terminology, Types of gears and Tooth systems, Force and Stress Analyses, AGMA guidelines, Selection Procedure	Lecture Notes Reading: Childs, Chapter 6, 7	

#### Vacation Week - 13 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
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#### Week 6 - 20 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Flexible Machine Elements - Design and selection of belt and chain drives	Lecture Notes Reading: Childs, Chapter 8	<b>Problem Solving</b> Due: Week 6 Friday (24 Aug 2018) 11:55 pm AEST

#### Week 7 - 27 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design and Selection of Springs	Lecture Notes Reading: Childs, Chapter 11	

#### Week 8 - 03 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design and Selection of Seals	Lecture Notes Reading: Childs, Chapter 9	

#### Week 9 - 10 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
1. Design of Permanent Joints - Welds and Rivets, Static design approach 2. Design of Non-Permanent Joints - Threaded fasteners, adhesive joints	Lecture Notes Reading: Childs, Chapter 12	

#### Week 10 - 17 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design and Selection of Frames, Casings and Housings	Lecture Notes Reading: Childs, Chapter 13	

#### Week 11 - 24 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Couplings, Clutches & Brakes	Lecture Notes Reading: Childs, Chapter 10	

#### Week 12 - 01 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic
Machine and Component Safety Considerations	Lecture Notes	Due: Week 12 Monday (1 Oct 2018) 11:45 pm AEST

#### Review/Exam Week - 08 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic
		<b>Applied Problem Solving</b> Due: Review/Exam Week Monday (8 Oct 2018) 11:45 pm AEST

## Assessment Tasks

### 1 Problem Solving

#### 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

Week 6 Friday (24 Aug 2018) 11:55 pm AEST

#### Return Date to Students

Week 8 Monday (3 Sept 2018)

#### 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:

1. Free Body Diagrams (FBD)
2. Use of correct equations to solve the problem
3. Presenting final results in correct units

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, e.g., 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 \(author-date\)](#)
- [Turabian](#)

#### Submission

Online

#### 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 Applied Problem Solving**

### **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 Monday (8 Oct 2018) 11:45 pm AEST

### **Return Date to Students**

Exam Week Monday (15 Oct 2018)

### **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:

1. Free Body Diagrams (FBD)
2. Use of correct equations to solve the problem
3. Presenting final results in correct units

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, e.g., 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 \(author-date\)](#)
- [Turabian](#)



**Submission**

No submission method provided.

**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

**No Assessment Title****Assessment Type**

Written Assessment

**Task Description**

No Assessment Task Description

**Assessment Due Date**

Week 12 Monday (1 Oct 2018) 11:45 pm AEST

**Return Date to Students**

Review/Exam Week Monday (8 Oct 2018)

**Weighting**

Pass/Fail

**Minimum mark or grade**

50%

**Assessment Criteria**

This assessment will be marked as a pass or fail only. You are expected to attempt at least 50% of the problems to attain a pass in this assessment.

**Referencing Style**

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

**Submission**

Online

**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