ENAM12006 *Mechanical Component Selection*
Term 2 - 2020

Profile information current as at 07/05/2024 04:25 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 - 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: 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 Unit Coordinator

Feedback
Enhance delivery materials and style of delivery.

Recommendation
As this is a distance education, the appropriate Learning Guide connected to prescribed textbook should be prepared for the individual week for students that may guide them through their learning experience.

Feedback from Unit Coordinator

Feedback
Change of textbook.

Recommendation
Replace the existing textbook (currently Peter Childs) by the best one, in this area, Joseph Shigley, et al. or by Juvinall Marshek which are the most popular and used worldwide.

Feedback from Students

Feedback
Weekly workbook should have to be more interactive by students and lecturer.

Recommendation
Feedback on weekly workbook activities should be provided instantly every week.

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

Shigley's Mechanical Engineering Design (SI Version)
Authors: Richard G. Budynas, and J. K. Nisbett
Mc Graw Hill Education
USA
Binding: Paperback
ENAM12006

Supplementary

Juvinall's Fundamentals of Machine Component Design (SI Version)
Authors: Robert C. Juvinall, and K M Marshek
Wiley
USA
Binding: eBook

Additional Textbook Information
If you prefer to study with a paper copy, they are available at the CQUni Bookshop here: http://bookshop.cqu.edu.au (search on the Unit code). eBooks are available at the publisher's website.

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

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

Schedule

Week 1 - 13 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Fits and Tolerances	Engineering Drawing Handbook, Chapter 12	Tutorial via Zoom

Week 2 - 20 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Shaft and Axles: Shaft Design - Principles and Purposes	Shigley, Chapters 4 and 18	Tutorial via Zoom

Week 3 - 27 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Shaft Design (Contd.)	Shigley, Chapter 18	Tutorial via Zoom

Week 4 - 03 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Bearing Selection and Applications	Shigley, Chapter 11	Tutorial via Zoom

Week 5 - 10 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Drive Systems - Gears and Keys	Shigley, Chapter 13 and 14	Tutorial via Zoom

Vacation Week - 17 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
		Assignment One
Study Break Complete Assignment 1		**Design Problem Solving 1** Due: Vacation Week Friday (21 Aug 2020) 11:45 pm AEST

Week 6 - 24 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Gear Design (contd.)	Shigley, Chapter 13 and 14	Tutorial via Zoom

Week 7 - 31 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Belt Drive Design: Belts and Pulleys	Shigley, Chapter 17	Tutorial via Zoom

Week 8 - 07 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Threaded Fasteners: Selection and Design	Shigley, Chapter 8	Tutorial via Zoom

Week 9 - 14 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Design of Permanent Joints - Welds & Rivets	Shigley, Chapter 9	Tutorial via Zoom

Week 10 - 21 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Design of Chain Drives: Chains and Sprockets	Shigley, Chapter 17	Tutorial via Zoom

Week 11 - 28 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
1. Coupling and Clutches: Application and Design Principles	Shigley, Chapter 16	Tutorial via Zoom

Week 12 - 05 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic
		Assignment Two
1. Design Project Management and Design economics	Lecture notes	**Design Problem Solving 2** Due: Week 12 Friday (9 Oct 2020) 11:45 pm AEST

Review/Exam Week - 12 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic
		No formal examination Port Folio **Workbook** Due: Review/Exam Week Friday (16 Oct 2020) 11:45 pm AEST

Exam Week - 19 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Design Problem Solving 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 (21 Aug 2020) 11:45 pm AEST

Return Date to Students
Week 9 Friday (18 Sept 2020)

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) or schematic illustration of the problem
2. Use of correct equations and approach 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 and equations in original form 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, assumptions etc, if any.

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

- Assignment title page
- The problem is clearly identified
- Clear statement of each problem and it's 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
Submit as a PDF document

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 Design Problem Solving 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
Week 12 Friday (9 Oct 2020) 11:45 pm AEST

Return Date to Students
Exam Week Friday (23 Oct 2020)

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) and appropriate schematics
2. Use of correct equations and approach 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)

- Assignment title page
- 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
Submit as a PDF document

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
This submission will contain evidences of your weekly workings of various tutorial problems and other examples and concepts.

Assessment Due Date
Review/Exam Week Friday (16 Oct 2020) 11:45 pm AEST

Return Date to Students
Exam Week Friday (23 Oct 2020)

Weighting
Pass/Fail

Minimum mark or grade
PASS: Appropriately attempting at least 80% of assigned tasks.

Assessment Criteria
The procedures and criteria used in the first two assessments will apply.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit as a PDF document

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