In Progress

Please note that this Unit Profile is still in progress. The content below is subject to change.

ENEM13015 *Design of Machine Elements*

Term 2 - 2022

Profile information current as at 18/05/2022 05:53 am

All details in this unit profile for ENEM13015 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

Design of Machine Elements is aimed at integrating and applying prior knowledge in fundamental design, materials sciences, mechanics of materials, statics and dynamics coupled with design strategies and knowledge of machine elements to design various machine components. These skills and knowledge will help you to design, analyse, synthesise and deliver robust engineering solutions. You will acquire strong analytical knowledge of machine elements, their design and load carriage and power transmission mechanics.

Details

Career Level: *Undergraduate*
Unit Level: *Level 3*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Prerequisites: MATH11219 Engineering Mathematics AND (ENEM12009 Structural Mechanics OR ENEM14012 Solid Mechanics and Computational Analysis)
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 - 2022

- Bundaberg
- Cairns
- Gladstone
- Mackay
- Online
- Rockhampton

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: 20%
2. **Project (applied)**
Weighting: 50%
3. **Project (applied)**
Weighting: 30%

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

Feedback

Some students lack fundamental knowledge in Engineering Drawing and CAD

Recommendation

Continue to provide additional material to support such students.

Unit Learning Outcomes

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

1. Develop detailed design of machine components to Australian and International Standards
2. Apply the formal procedures of detailed machine design, including requirements, solutions, modelling and evaluation to solve problems
3. Analyse and design a range of machine elements, explain the physical basis of their design, usage and operational limitations
4. Interpet various design codes and standards
5. Work effectively in teams by: identifying individual roles and responsibility, interacting positively with colleagues, and communicating effectively at group meetings
6. Communicate as professionals through the production of drawings (computer aided) and Bill of Materials, and through written technical reports.

The Learning Outcomes for this unit are linked with the Engineers Australia Stage 1 Competency Standards for Professional Engineers in the areas of 1. Knowledge and Skill Base, 2. Engineering Application Ability and 3. Professional and Personal Attributes at the following levels:

Intermediate 1.4 Discernment of knowledge development and research directions within the engineering discipline. (LO: 1I 4I) 1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline. (LO: 1I 4I)

Advanced 1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline. (LO: 1A 3A) 1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline. (LO: 1A) 1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline. (LO: 1I 3A 4A) 1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline. (LO: 1I 3I 5A) 2.1 Application of established engineering methods to complex engineering problem solving. (LO: 2A 5A) 2.2 Fluent application of engineering techniques, tools and resources. (LO: 2I 6A) 2.3 Application of systematic engineering synthesis and design processes. (LO: 2A 3A) 2.4 Application of systematic approaches to the conduct and management of engineering projects. (LO: 5A) 3.1 Ethical conduct and professional accountability. (LO: 5A) 3.2 Effective oral and written communication in professional and lay domains. (LO: 5A 6A) 3.3 Creative, innovative and pro-active demeanour. (LO: 2A) 3.4 Professional use and management of information. (LO: 1A 4A) 3.5 Orderly management of self, and professional conduct. (LO: 6A) 3.6 Effective team membership and team leadership. (LO: 5A)

Note: LO refers to the Learning Outcome number(s) which link to the competency and the levels: N – Introductory, I – Intermediate and A - Advanced.

Refer to the Engineering Undergraduate Course Moodle site for further information on the Engineers Australia's Stage 1 Competency Standard for Professional Engineers and course level mapping informationhttps://moodle.cqu.edu.au/course/view.php?id=1511

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
1 - Written Assessment - 20%		•	•			
2 - Project (applied) - 50%	•	•		•	•	•
3 - Project (applied) - 30%	•		•	•		•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
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 - 20%		•	•							
2 - Project (applied) - 50%	•	•	•	•	•	•	•	•		

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
3 - Project (applied) - 30%		•	•	•		•				

Textbooks and Resources

Textbooks

ENEM13015

Prescribed

Shigley's Mechanical Engineering Design
Edition: 11th edn (2021)
Authors: Richard G Budynas and Keith J Nisbett
McGraw Hill
Singapore
ISBN: 9789813158986
Binding: Paperback

Additional Textbook Information
An e-book would also be fine.

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

Academic Integrity Statement

Information for Academic Integrity Statement has not been released yet.
This unit profile has not yet been finalised.