Course Title: Introduction to Engineering Design

Part B: Course Detail

The following link provides important information on the topics below:

* Academic integrity
* Academic progress
* Appeals
* Assessment adjustments (extensions, special consideration, equitable assessment arrangements)
* Award levels
* Grades
* Student feedback

**Teaching Period:**OFFSe22023

**Class Number:**All

**Class Section:**All

*For flexible terms and optional semesters, a Part B course guide may have been published for the entire teaching period, or for the specific class number in which you are enrolled. If there is no Part B course guide published for your specific class number, please refer to the guide for the teaching period in which you are enrolled. Enrolment Online is the definitive source for details regarding your class enrolment.*

**Course Code:** OENG1277

**Course Title:** Introduction to Engineering Design

**School:** 172H School of Engineering

**Career:**Undergraduate

**Campus:**Birla Inst of Tech&Sci, Pilani

**Learning Mode:**Face-to-Face

**Primary Learning Mode:**

This course will be delivered in a blended learning mode, including pre-recorded online lectures, timetabled online lectorials and face-to-face computer laboratory, and project-based assessment task designed to encourage further learning.

**Credit Points:**12.00

**Teacher Guided Hours:**48 per semester

**Learner Directed Hours:**72 per semester

**Offering Coordinator:**Associate Professor Abhijit Date

**Offering Coordinator Phone:**+61 3 9925 0612

**Offering Coordinator Email:**[abhijit.date@rmit.edu.au](mailto:abhijit.date@rmit.edu.au)

**Offering Coordinator Location:**B251.02.029

**Offering Coordinator Availability:**By prior appointment, between 9am to 5pm Australian Eastern Standard time

**Additional Staff Contact Details**

**Pre-requisite Courses and Assumed Knowledge and Capabilities**

None

**Course Description**

This course provides students with a foundation in engineering design practice and prepares them for discipline-specific advanced courses in engineering design. Students will gain experience in the use of digital design techniques and management of larger open-ended, team-based engineering design tasks in a project-based learning environment. Students will learn to create detailed design of real world products and systems by applying design thinking and scientific principles. Students will learn a range of design techniques to contextualize, evaluate, and communicate designs, from generating ideas via sketching to development of digital models and detailed technical drawings that meet the Australian and international standards. Students will develop foundation skills in computer-aided design (CAD) techniques to generate 3D models of products and assemblies and learn to integrate them in augmented and virtual reality tools.

**Objectives/Learning Outcomes/Capability Development:**

This course contributes to Program Learning Outcomes (PLOs) for:

**PLO 2:** Utilise mathematics and engineering fundamentals, software, tools and techniques to design engineering systems for complex engineering challenges.  
  
**PLO 4:** Apply systematic problem solving, design methods and information and project management to propose and implement creative and sustainable solutions with intellectual independence and cultural sensitivity.

**PLO 5:** Communicate respectfully and effectively with diverse audiences, employing a range of communication methods, practising professional and ethical conduct.

For more information on the program learning outcomes for your program, please see the [program guide](http://www1.rmit.edu.au/browse;ID=vpuqinw1z7jr;STATUS=A).

Upon successful completion of this course, you will be able to:

1. Apply key elements of the design process and scientific principles to create detailed design of a product that meets engineering requirements and standards;
2. Generate and interpret engineering technical drawings of parts and assemblies according to engineering design standards; and
3. Use CAD software to generate a computer model of a well-defined part or assembly.

**Overview of Learning Activities**

You will be actively engaged in a range of learning activities such as lectorials, tutorials, practicals, laboratories, seminars, project work, class discussion, individual and group activities. Delivery may be face to face, online or a mix of both.  
  
You are encouraged to be proactive and self-directed in your learning, asking questions of your lecturer and/or peers and seeking out information as required, especially from the numerous sources available through the [RMIT library](https://rmit.edu.au/library), and through links and material specific to this course that is available through [myRMIT Studies Course](https://rmit.edu.au/students/my-course).

**Details of Learning Activities**

Pre-recorded lecture videos will introduce you to concepts and theory.

Lectorials will be used to review theory and clear any doubts that you may have about the theory.

Practical/Tutorial/Computer lab activities will be used to practice engineering design and drawing concepts and practice CAD software skills.

**Teaching Schedule**

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| --- | --- | --- |
| **Week** | **Topic** | **Assessments** |
| Week 1 | Course overview and Academic integrity |  |
| Week 2 | Engineering Design process |  |
| Week 3 | Introduction to Engineering Drawing | Assessment Task (AT) 1 – Online Quiz (3%)  Due: Weekly during the computer lab |
| Week 4 | Introduction to Orthogonal Projection – Part 1 | AT 1 - Online Quiz (3%)  Due: Weekly during the computer lab |
| Week 5 | Introduction to Orthogonal Projection – Part 2 | AT 1 - Online Quiz (3%)  Due: Weekly during the computer lab |
| Week 6 | Projections of lines, points, planes, and objects (solids) | AT 1 - Online Quiz (3%)  Due: Weekly during the computer lab |
| Week 7 | Dimensioning and Tolerancing | AT 1 - Online Quiz (3%)  Due: Weekly during the computer lab |
| Week 8 | No Lecture (Class test) | Assessment Task 2 - 20% - This will be in class test. |
| Week 9 | RMIT Non-teaching week |  |
| Week 10 | Isometric Projections and 3D CAD | AT 1 - Online Quiz (2.5%)  Due: Weekly during the computer lab |
| Week 11 | Introduction to assembly and sectional views | AT 1 - Online Quiz (2.5%)  Due: Weekly during the computer lab |
| Week 12 | Manufacturing processes and materials |  |
| Week 13 | Project (No lectorial) | Students are meant to work on their project during the lectorial and computer lab time |
| Week 14 | Project (No lectorial) | Students are meant to work on their project during the lectorial and computer lab time |
| Week 15 | Project (No lectorial) | Students are meant to work on their project during the lectorial and computer lab time |
| Week 16 | Project Presentation and final submission | Assessment Task 3 – Project (30%)  Due: Week 16 |
|  |  | Assessment Task 4 - End of semester exam (30%)  Due date will be announced during the semester. |

**Learning Resources**

**References**

|  |  |
| --- | --- |
| Engineering drawing Parthasarathy, N. S., author.; Murali, Vela, author. 2015, | 9780199455393 |
| A first course in engineering drawing Rathnam, K. | 9789811053580 |
| Engineering Drawing and Design, 6th Edition David A Madsen | 9780357699706 |

**Overview of Assessment**

This course has no hurdle requirements.

**Assessment Tasks**

|  |
| --- |
| **Offshore Assessment Schedule:**  **Assessment Task 1:**Lab QuizWeighting: 20% This assessment task supports CLOs: 1 & 2  **Assessment Task 2:**Class Test Weighting: 20% This assessment task supports CLOs 1, 2 & 3  **Assessment Task 3:**Project/Assignment Weighting: 30% This assessment task supports CLOs: 1, 2, & 3  **Assessment Task 4:**End-of-Semester Examination Weighting: 30% This assessment task supports CLOs: 1, 2 & 3 |

If you have a long-term medical condition and/or disability it may be possible to negotiate to vary aspects of the learning or assessment methods. You can contact the program coordinator or Equitable Learning Services if you would like to find out more.

**Assessment Tasks**

**Offshore Assessment Schedule:**

**Assessment Task 1: Quizzes/assessment during the practical session**

Weighting: 20%

This assessment task supports CLOs: 1 & 2

Description: You will have to solve quizzes/assessment during the practical sessions based on the topic covered in the lecture and practical.

**Assessment Task 2:**Mid-Sem Exam

Weighting: 20%

This assessment task supports CLOs 1, 2 & 3

Description: Generate and interpret engineering technical drawings of parts.

Nature of Component: Closed Book

**Assessment Task 3:**Project/Assignment

Weighting: 30%

This assessment task supports CLOs: 1, 2, & 3

Description: Design a part and assembly using engineering design process that meets engineering requirements and standards. Generate and interpret engineering technical drawings of parts and assemblies and use CAD software to generate a computer model of a well-defined part and assembly.

**Assessment Task 4:**Comprehensive Exam

Weighting: 30%

This assessment task supports CLOs: 1, 2 & 3

Description: This will be the comprehensive exam that will test your knowledge and understanding of all topics. computer model of a well-defined part and assembly.

Nature of Component: Closed Book

**Other Relevant Information**

Assignments received late and without prior extension approval or special consideration will be penalised by a deduction of 10% of the total score possible per calendar day late for that assessment.