Pathways and Academic Learning Support Centre

EPFNEG110: Introduction to Mechanical Engineering Design

Callaghan

Semester 1 - 2024

COURSE OUTLINE

The Pathways and Academic Learning Support Centre recognises and respects the unique history and culture of Aboriginal and Torres Strait Islander peoples and their unbroken relationship with the lands and the waters of Australia over millennia. We are dedicated to reconciliation and to offering opportunities for Aboriginal and Torres Strait Islander peoples to access and succeed in higher education. The Centre is committed to providing a culturally safe and inclusive environment for all.

OVERVIEW

Course Description

This course enables students to develop basic spatial skill by using a solid modelling system. Students develop skills in interpreting and visualising 3D objects in 2D format. They create and assemble solid model representation of machine components and create 2D engineering drawings from solid models. Students develop advanced technical sketching skills to aid communication in engineering design.

Academic Progress Requirements

Nil

Requisites

This course does not count with MECH1110 or FNEG1110.

Contact Hours

Computer Lab
Face to Face On Campus
2 hour(s) per week(s) for 12 week(s) starting Week 2

Lecture
Face to Face On Campus
2 hour(s) per week(s) for 12 week(s) starting Week 1

Tutorial
Face to Face On Campus
1 hour(s) per week(s) for 13 week(s) starting Week 1

Unit Weighting

10

Workload

Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

CONTACTS

Course Coordinator

Mr Chris Hatchwell
Chris.Hatchwell@newcastle.edu.au
Consultation: Please email to schedule an appointment.

Teaching Staff

Other teaching staff will be advised on the course Canvas site.

School Office

Callaghan
Ground Floor, General Purpose Building (GP)
Ph: 02 4921 5558
enabling@newcastle.edu.au

Ourimbah
HO 168, Humanities Building
Ph: 02 4348 4076
enabling@newcastle.edu.au

SYLLABUS

Course Content

- Basic spatial skill through the use of a solid modelling system
- Interpreting and visualizing 3D objects in 2D format are developed
- Solid model representation of machine components
- Creating 2D engineering drawings from solid models
- Advanced technical sketching skills to aid communication in engineering design

Course Learning Outcomes

On successful completion of this course, students will be able to:
1. Communicate through technical sketching.
2. Interchange engineering graphical information from 2D to 3D and back.
3. Demonstrate a foundational skill set with 3D solids modelling.

Course Materials

All course materials will be provided on the course Canvas site. Students are not required to purchase a textbook however the following is recommended:

A.W. BOUNDY, Engineering Drawing, 8th edition (with workbook), McGraw-Hill Education, ISBN 9780071016766. Note that the 6th and 7th editions of the text without workbook are adequate, though the practice examples in the workbook are useful. Exercise numbers in the older editions will differ from those given in the class notes.

SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	26 Feb	Course Introduction	No tutorial or laboratory	
2	4 Mar	Introduction to Computer Aided Design	Modelling with Extrudes	
3	11 Mar	Orthographic Projections	Modelling with Revolves	
4	18 Mar	Isometric Views	Modelling with Patterns and Constraints	
5	25 Mar	AS1100, Tolerances and Section Views	Additional Modelling Functions	
6	1 Apr	Assemblies and Modelling at the Assembly Level	Assemblies and Exploded Views	
7	8 Apr	Advanced CREO Features	Mechanisms in CREO	
Mid-Semester Recess				
Mid-Semester Recess				
8	29 Apr	Boarders, Title Blocks, Scales and Schematics	AS1100 Title Blocks	Sketching Portfolio Friday 3rd May 4pm
9	6 May	Assembly Drawings	Assembly Drawings	
10	13 May	Detailed Drawings	Detailed Drawings	
11	20 May	Production Methods	Final Portfolio Submission Preparation	Computer Aided Solids Modelling Portfolio Friday 24th May 4pm
12	27 May	Course Recap	Computer Aided Solid Modelling Revision	
13	3 Jun		Computer Aided Solid Modelling Quiz	Computer Aided Solid Modelling Quiz during computer laboratory
Examination Period				
Examination Period				

ASSESSMENTS

This course has 4 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Sketching Portfolio	Friday 3rd May 4pm	Individual	20%	1, 2
2	Computer Aided Solids Modelling Portfolio	Friday 24th May 4pm	Individual	40%	2, 3
3	Computer Aided Solids Modelling Quiz	During computer laboratory Week 13	Individual	20%	3
4	Formal Sketching Exam	Examination Period	Individual	20%	1, 2

Late Submissions The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Sketching Portfolio

Assessment Type	Portfolio
Description	This portfolio requires students to conduct measurements of items and create technical sketches as outlined in the sketching portfolio handout.
Weighting	20%
Due Date	Friday 3rd May 4pm
Submission Method	Online
Assessment Criteria	Clarity of drawings
Return Method	Online
Feedback Provided	Feedback will be provided in Canvas

Assessment 2 - Computer Aided Solids Modelling Portfolio

Assessment Type	Portfolio
Description	The portfolio leverages off the sketching portfolio and involves students translating hand sketches into a solid model. More advanced modelling techniques are introduced gradually, and a quality set of drawings are to be submitted.
Weighting	40%
Due Date	Friday 24th May 4pm
Submission Method	Online
Assessment Criteria	Visual accuracy of the model, compliance with AS1100, quality of presentation
Return Method	Online
Feedback Provided	Feedback will be provided in Canvas

Assessment 3 - Computer Aided Solids Modelling Quiz

Assessment Type	Quiz
Description	Students will be required to build a high-quality solid model within a limited time frame to demonstrate appropriate skills in the use of the PTC CREO package.
Weighting	20%
Due Date	During computer laboratory in Week 13
Submission Method	Online
Assessment Criteria	Geometric accuracy of the model, appropriateness of the assembly drawings
Return Method	Online
Feedback Provided	Feedback will be provided in Canvas

Assessment 4 - Formal Sketching Exam

Assessment Type	Formal Examination
Description	The exam will test the students' knowledge and skills in the graphical communication form. The exam is an open book exam, so students have access to resources from throughout the semester.
Weighting	20%
Due Date	During the examination period
Submission Method	Formal exam
Assessment Criteria	Capacity to communicate using graphical means and general compliance with AS1100.
Return Method	Not returned
Feedback Provided	No feedback will be provided for this assessment

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

Communication Methods

Email is the principal form of communication at the university and within this course. Always use your student email (NUmail), rather than a private email address, and check this regularly. As Course Coordinator I will try to respond to your email within three (3) working days. I will not normally respond to emails over the weekends. Please be courteous in your email communication and in the online space.

Canvas is used to distribute course material, announcements and other information. It is also used for online quizzes and to allow students to track their individual progressive assessment results throughout the semester via Grades.

Discussions forums in Canvas can be used to ask questions about minor issues. Students are strongly encouraged to use these to communicate with each other, discuss issues relating to the course, and solve minor problems.

Attendance and Engagement

All students in 1000 level courses must participate in 80% of non-lecture activities i.e. tutorials, workshops, laboratories to pass the course. Attendance will be recorded, so all students should check-in/record their attendance via the myUON app.

It is strongly recommended that you attend all weekly lectures. If you are unable to attend a class, it is your responsibility to catch up on any missed work by accessing recorded lectures and resources available on your Canvas site.

In addition to face-to-face hours in class, out-of-class study and related work will require an additional commitment of up to 10 hours per week of reading, preparation and study time over the semester. Students are required to spend on average 120-140 hours of effort (contact and non-contact including assessment) per semester per 10 unit course.

A plan of regular revision throughout the semester is also strongly recommended to help you manage your time, consolidate information and retain that knowledge for the duration of the course and beyond.

Assessment items have been designed to reinforce and revise the course material, and ensure you are up to date with course content. You are required to submit all assessable

items by the due dates unless prior arrangements have been made.

Additional Contact Details

If you have any questions about your course, please speak with your course coordinator, lecturer or tutor first. For general enquiries, please contact the Pathways and Academic Learning Support Centre Office or your Student Liaison Officer. Contact details for both the office and Student Liaison Officers can be found here.

Yapug students can also contact your Indigenous Enabling Learning Advisor Hannah Pipe or your Program Convenor Dan Collins.

Final Examination

This course has a formal examination. All formal examinations will be held during the University's Examination Period. Your exam timetable will be available approximately 4 weeks before the exam period and you must ensure that you are available to undertake your exam at any time during the Examination Period.

If you are unable to attend a scheduled examination due to illness or you have another significant, verifiable reason, contact the Pathways and Academic Learning Support Office and advise your lecturer at the earliest opportunity. Completion of an online Adverse Circumstances application including appropriate documentation is required.

If you have a permanent or temporary disability or medical condition that means you may need adjustments made during your examination, you must register with AccessAbility at the start of semester so that these arrangements can be made.

If you have a Reasonable Adjustment Plan (RAP), your examination will be scheduled in accordance with it. If you are unable to attend your scheduled examination due to illness or other circumstance, you will need to submit and online Adverse Circumstances application and supply appropriate documentation to support your application. Your RAP is not able to be used as your documentation.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for Adverse Circumstances must be lodged via the online Adverse Circumstances system for all individual assessment items worth 30% or greater **by 11:00pm on the day the assessment is due**. For assessment items less than 30%, you will need to contact your Course Coordinator by 11:00pm on the due date of the assessment item.

Before applying you must refer to the Adverse Circumstances Affecting Assessment Items Procedure and the Adverse Circumstances Affecting Assessment Items Policy.

Please note that students must submit their adverse circumstances application via the online Adverse Circumstances system by 11:00pm on the due date of the assessment item, even if you are using a Reasonable Adjustment Plan (RAP) as your supporting documentation.

Written Assessment Word Limits

If this course includes written assessments, the word limit listed will include headings, sub-heading, in-text citations, quotes and referencing but does not include the list of references, appendices and footnotes. You will not receive a penalty for exceeding the word limit (there is a tolerance of up to 10%), but any work after the maximum word limit may not be included within the allocation of marks.

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. Please refer to the Student Academic Integrity Policy.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the Oral Examination (viva) Procedure. In cases where the oral examination reveals the assessment item may not be

	the student's own work the case will be dealt with under the Student Conduct Rule.
Workplace Health and Safety Requirements	There are no specific WH&S requirements for this course.
Software	Free Microsoft Office software is available to enrolled students here and includes 5 TB of free cloud storage with OneDrive.
Timetable	Your timetable for this course is available via the myUni Student Portal and can also be found here.
Course Evaluation	Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.
Important Policy Information	The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures that support a safe and respectful environment at the University.

This course outline was approved by the Director, PALS. No alteration of this course outline is permitted without Director approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.