



MECH401

Product Design Engineering

S1 Day 2017

Dept of Engineering

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	3
<u>Delivery and Resources</u>	5
<u>Unit Schedule</u>	5
<u>Policies and Procedures</u>	5
<u>Graduate Capabilities</u>	7
<u>Changes from Previous Offering</u>	9

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Agi Kourmatzis

agi.kourmatzis@mq.edu.au

Shaokoon Cheng

shaokoon.cheng@mq.edu.au

Credit points

3

Prerequisites

9cp at 300 level including MECH303

Corequisites

Co-badged status

Unit description

Students learn about the entire product design cycle from conceptualization of ideas to design, manufacturing and marketing. Students will be exposed to a range of consumer products and will implement their prior knowledge on how to improve existing designs by applying to state-of-the-art design and manufacturing techniques, advanced composites (including biomaterials) and different approaches that can be used to reduce the cost of final products. These products range from electronic household products, to biomedical implants and specific parts/ components of large machines used in heavy industries.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

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

Demonstrate an ability to apply the analytical, design, and theoretical techniques learned throughout the first 3 years of the degree to the design and development of a new innovative product.

Demonstrate team building abilities and communication skills in the multidisciplinary design of a new product.

Define and critically assess the key features of product design and development in a

mechanical engineering context.

Demonstrate an ability to innovate and develop a new product based on identifying market opportunities leading to a final engineering design and cost forecasting analysis.

General Assessment Information

1. You must obtain an aggregate pass grade (at least 50%) to pass the unit.
2. The only invigilated assessment is an in-class test to take place in the week 10 lecture.
3. There are no hurdle assessments.
4. For assignments handed in late the following penalties apply: 0-24hrs -25%, 24-48hrs -50%, more than 48hrs -100%.
5. Rubrics for all assessments are standards based and will be made available on iLearn by week 1. Macquarie standards for the definition of pass, credit, distinction and high distinction will also be made available on iLearn by week 1.
6. For each group assessment handed in, it is an absolute requirement that the group submits the signed MECH401 assignment coversheet (to be made available on iLearn) clearly indicating specific individual contributions of each team member so that individual marks are provided accordingly. In the event that an assignment is submitted without a fully completed MECH401 coversheet then the assignment will be deemed a late submission and the penalties from point (4) above will apply until the coversheet is submitted.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Tutorial Problem Solving</u>	5%	No	Weeks 2-6
<u>Mentor Meeting Engagement</u>	5%	No	Weeks 2-13
<u>Concept Design</u>	20%	No	Week 7
<u>In-Class Test</u>	20%	No	Week 10
<u>Management Report</u>	10%	No	Week 12
<u>Final Design</u>	30%	No	Week 13
<u>Prototype Presentation</u>	10%	No	Week 13

Tutorial Problem Solving

Due: **Weeks 2-6**

Weighting: **5%**

Tutorial Problems

On successful completion you will be able to:

- Define and critically assess the key features of product design and development in a mechanical engineering context.

Mentor Meeting Engagement

Due: **Weeks 2-13**

Weighting: **5%**

Meetings with Mentor

On successful completion you will be able to:

- Demonstrate team building abilities and communication skills in the multidisciplinary design of a new product.

Concept Design

Due: **Week 7**

Weighting: **20%**

Concept Design Submission

On successful completion you will be able to:

- Demonstrate team building abilities and communication skills in the multidisciplinary design of a new product.
- Demonstrate an ability to innovate and develop a new product based on identifying market opportunities leading to a final engineering design and cost forecasting analysis.

In-Class Test

Due: **Week 10**

Weighting: **20%**

Invigilated Class Test

On successful completion you will be able to:

- Define and critically assess the key features of product design and development in a mechanical engineering context.

Management Report

Due: **Week 12**

Weighting: **10%**

Management Report Submission

On successful completion you will be able to:

- Demonstrate an ability to innovate and develop a new product based on identifying market opportunities leading to a final engineering design and cost forecasting analysis.

Final Design

Due: **Week 13**

Weighting: **30%**

Final Design Submission

On successful completion you will be able to:

- Demonstrate an ability to apply the analytical, design, and theoretical techniques learned throughout the first 3 years of the degree to the design and development of a new innovative product.

Prototype Presentation

Due: **Week 13**

Weighting: **10%**

Presentation

On successful completion you will be able to:

- Demonstrate team building abilities and communication skills in the multidisciplinary design of a new product.

Delivery and Resources

There is no mandatory core text for this unit. However, the following texts are recommended:

"Product Design and Development" by Ulrich and Eppinger

"Product Design for Engineers" by Shetty

Unit Schedule

A full unit schedule will be made available in the week 1 lecture slides

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcome

- Demonstrate an ability to innovate and develop a new product based on identifying market opportunities leading to a final engineering design and cost forecasting analysis.

Assessment tasks

- Concept Design
- Management Report

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcome

- Demonstrate an ability to innovate and develop a new product based on identifying market opportunities leading to a final engineering design and cost forecasting analysis.

Assessment tasks

- Concept Design
- Management Report

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge,

scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Demonstrate an ability to apply the analytical, design, and theoretical techniques learned throughout the first 3 years of the degree to the design and development of a new innovative product.
- Define and critically assess the key features of product design and development in a mechanical engineering context.

Assessment tasks

- Tutorial Problem Solving
- In-Class Test
- Final Design

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Demonstrate an ability to apply the analytical, design, and theoretical techniques learned throughout the first 3 years of the degree to the design and development of a new innovative product.
- Define and critically assess the key features of product design and development in a mechanical engineering context.

Assessment tasks

- Tutorial Problem Solving
- In-Class Test
- Final Design

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcome

- Demonstrate an ability to apply the analytical, design, and theoretical techniques learned throughout the first 3 years of the degree to the design and development of a new innovative product.

Assessment task

- Final Design

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcome

- Demonstrate team building abilities and communication skills in the multidisciplinary design of a new product.

Assessment tasks

- Mentor Meeting Engagement
- Concept Design
- Prototype Presentation

Changes from Previous Offering

The following changes have been made to this offering compared to 2016 based on both student (LEU survey) and peer feedback:

1. The removal of the "pitch report"
2. Deadline of concept design report moved to week 7 from week 9.
3. The addition of an in-class test

4. Final Design report reduced from 40% to 30%, Final Management report reduced from 15% to 10%
5. Logbook no longer assessed