MECH4001

Product Design Engineering

Session 1, Weekday attendance, North Ryde 2020

School of Engineering

Contents

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General Information

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Credit points
10

Prerequisites
((MECH3003 or MECH303) and (MECH3001 or MECH301) and (MECH3004 or MECH304) and (MECH3002 or MECH302)) or Admission to MEngMechEng

Corequisites

Co-badged status

Unit description
This is a capstone unit. This unit examines the entire product design cycle from conceptualization of ideas to design, manufacturing and marketing. Students are expected to effectively apply knowledge in the field of mechanical engineering to produce innovative products with sound value proposition. Students are expected to apply state-of-the-art design and manufacturing techniques, advanced composites (including biomaterials) or other creative and innovative approaches in their product innovations.

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:

ULO1: Apply acquired analytical and theoretical techniques to the design and development of an innovative product.

ULO3: Assess and evaluate the critical aspects of product design and development in a mechanical engineering context.

ULO4: Demonstrate team-building abilities and communication skills in the design and development of a product.

ULO2: Create an innovative product based on evidence of market opportunities leading to a commercially viable product.

ULO5: Demonstrate professionalism in engaging with industry experts and companies through practical learning activity.

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult iLearn for revised unit information.

Find out more about the Coronavirus (COVID-19) and potential impacts on staff and students

General Assessment Information

Grading and passing requirement for unit

In order to pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

For further details about grading, please refer below in the policies and procedures section.

Late submissions and Resubmissions

For assignments handed in late, the following penalties apply 0-48hrs: -50%, >48hrs: -100%. Extenuating circumstances will be considered upon lodgment of a formal notice of disruption of studies.

Resubmissions of work are generally allowed unless stated prior or otherwise.

Additional information

1. The only invigilated assessment is an in-class test to take place in the week 10 lecture.

2. Hurdle assessments: Attendance of >80% of the workshop tutorials are required. Each workshop is 3hrs long.

3. Rubrics for all assessments are standards-based and will be made available on iLearn by week 1.

4. 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. SPARKPLUS peer evaluation is also required for the submission. In the event that an assignment is submitted without a fully completed MECH401 coversheet then the assignment will be deemed a late submission and penalties will apply until the coversheet is submitted.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

The following texts are recommended for this unit:

1. "Product Design and Development" by Ulrich and Eppinger
2. "Product Design for Engineers" by Devdas Shetty

Technology include:

1. Web learning tool; website link on iLearn.
2. In class computers and CREO CAD software will be provided.

Unit Schedule

Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult iLearn for latest details, and check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Refer to iLearn and lecture notes for the unit schedule. The topics to cover will loosely follow the following order:

1. Brainstorming of product/problem ideas
2. assessing idea innovation and creativity
3. derivation of concept variant and design for manufacturing and assembly
4. market analysis, benchmarking and cost analysis

5. FMEA analysis
6. Design and technical analysis
7. Prototyping and detailed FMEA analysis
8. Final "Shark-tank" pitch and presentation

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) 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 or if you are a Global MBA student contact globalmba.support@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 help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

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

If you are a Global MBA student contact globalmba.support@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.

Changes from Previous Offering

Changes to the previous offering include:

2020:

- New unit guide information
- More comprehensive assessment criteria.
- Inclusion of hurdle requirement for attendance of the workshop tutorial to ensure project progress is made.
- Inclusion of SPARKPLUS peer evaluation grading process for group submissions
- Introduction of individualised oral defence to validate students' meet learning outcome.
- Update to www.MQIDEA.com web tool to further the incubation of innovative product

ideas.

- Minor update to grading rubrics.

2019:

- Of site visit to industry partner's showroom for the introduction and enhanced topic engagement
- Invitation of external evaluators for the final pitch competition
- Venue changed for final pitch competition: to be hosted at the MQ Incubator
- Restructuring workshop activities to stress on the brainstorming activities prior to further design improvement
- Extension of the www.MQIDEA.com web tool for student work benchmarking (against previous year's cohort)

Changes since First Published

Date	Description
05/02/2020	staff contact information added.