



# MECH203

## Mechanical Design 1

S2 Day 2015

*Dept of Engineering*

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## General Information

Unit convenor and teaching staff

Convenor, Lecturer

Shaokoon Cheng

[shaokoon.cheng@mq.edu.au](mailto:shaokoon.cheng@mq.edu.au)

Contact via 98509063

E6B, 1.08

Tuesday, 1 - 3 pm

Co-convenor, Lecturer

Sammy Diasinos

[sammy.diasinos@mq.edu.au](mailto:sammy.diasinos@mq.edu.au)

E6B, 1.08

Credit points

3

Prerequisites

(ENGG150(P) or ENGG170(P) or ELEC170(P)) and (MATH132 or MATH135(P)) and ((PHYS106 and PHYS107) or (PHYS140(P) and PHYS143(P)))

Corequisites

Co-badged status

Unit description

In this unit students will develop their skills in machine drawing and engineering design. The unit will demonstrate to students the processes involved in the selection of machine elements and machine assembly design in an engineering context. The unit will introduce students to the principles of computer-aided design and manufacture.

## 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:

Ability to identify the usage of different types of permanent and non-permanent joints.

Ability to produce manufacturing drawings that meet industrial standards.

Ability to analyse power transmission, losses and speed reduction ratio in a mechanical

engineering system.

Ability to analyse, design and select machine elements (e.g. belts and pulleys, chain and sprockets, bearings) off-the-shelf using commercial available catalogs and specify appropriate manufacturing techniques for the elements.

Ability to present design concepts effectively and professionally.

## Assessment Tasks

Name	Weighting	Due
<u>Assignments</u>	15%	Week 4, Week 7
<u>Quiz</u>	10%	Week 9
<u>Design Reports</u>	30%	Week 8 to Week 13.
<u>Final examination</u>	45%	TBA

### Assignments

Due: **Week 4, Week 7**

Weighting: **15%**

There will be two assignments (7.5% each) on computer aided drawing (CAD).

On successful completion you will be able to:

- Ability to identify the usage of different types of permanent and non-permanent joints.
- Ability to produce manufacturing drawings that meet industrial standards.

### Quiz

Due: **Week 9**

Weighting: **10%**

This quiz will be held during lecture.

On successful completion you will be able to:

- Ability to identify the usage of different types of permanent and non-permanent joints.
- Ability to analyse power transmission, losses and speed reduction ratio in a mechanical engineering system.
- Ability to analyse, design and select machine elements (e.g. belts and pulleys, chain and sprockets, bearings) off-the-shelf using commercial available catalogs and specify appropriate manufacturing techniques for the elements.

## Design Reports

Due: **Week 8 to Week 13.**

Weighting: **30%**

There will be 4 design reports. Manufacturing drawings are required in all the design reports.

All design reports must be typewritten. Design reports must be submitted with a cover sheet and as PDF documents online using ILEARN. Reports that are not submitted with the aforementioned instructions will not be marked. Due date for the design reports are: Design Report 1: Week 9, Friday, 5pm. Design Report 2: Week 11, Friday, 5pm. Design Report 3: Week 12, Friday, 5pm. Design Report 4: Week 13, Friday, 5pm.

In the event that an assessment task is submitted late, the following penalties will apply; 0 to 24 hours -25%, 24 hours to 48 hours -50%, greater than 48 hours will result in no mark being awarded.

On successful completion you will be able to:

- Ability to identify the usage of different types of permanent and non-permanent joints.
- Ability to produce manufacturing drawings that meet industrial standards.
- Ability to analyse power transmission, losses and speed reduction ratio in a mechanical engineering system.
- Ability to analyse, design and select machine elements (e.g. belts and pulleys, chain and sprockets, bearings) off-the-shelf using commercial available catalogs and specify appropriate manufacturing techniques for the elements.
- Ability to present design concepts effectively and professionally.

## Final examination

Due: **TBA**

Weighting: **45%**

This will be a closed book exam. Attendance is compulsory for all students.

On successful completion you will be able to:

- Ability to analyse power transmission, losses and speed reduction ratio in a mechanical engineering system.
- Ability to analyse, design and select machine elements (e.g. belts and pulleys, chain and sprockets, bearings) off-the-shelf using commercial available catalogs and specify appropriate manufacturing techniques for the elements.

## Delivery and Resources

Text books:

Richard G Budynas, "Shigley's Mechanical Engineering Design." McGrawHill, 9th Edition.

A.W. Boundy, "Engineering drawing." McGrawHill, 5th Edition.

## 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](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

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

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

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/](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](http://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](http://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](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use 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:

#### Assessment task

- Design Reports

### 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

- Ability to identify the usage of different types of permanent and non-permanent joints.
- Ability to produce manufacturing drawings that meet industrial standards.
- Ability to analyse, design and select machine elements (e.g. belts and pulleys, chain and sprockets, bearings) off-the-shelf using commercial available catalogs and specify appropriate manufacturing techniques for the elements.

## Assessment tasks

- Assignments
- Quiz
- Design Reports
- Final examination

## 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 outcome

- Ability to analyse power transmission, losses and speed reduction ratio in a mechanical engineering system.

## Assessment tasks

- Assignments
- Quiz
- Design Reports
- Final examination

## 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 outcomes

- Ability to analyse power transmission, losses and speed reduction ratio in a mechanical engineering system.
- Ability to analyse, design and select machine elements (e.g. belts and pulleys, chain and sprockets, bearings) off-the-shelf using commercial available catalogs and specify appropriate manufacturing techniques for the elements.

## Assessment task

- Design Reports

## 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

- Ability to present design concepts effectively and professionally.

## Assessment task

- Design Reports