



MECH3005

Manufacturing Engineering

Session 1, In person-scheduled-weekday, North Ryde 2023

School of Engineering

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Disclaimer

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General Information

Unit convenor and teaching staff
Course Convenor & Lecturer
Shuying Wu
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Contact via shuying.wu@mq.edu.au
Room 146, 3MD
Wednesday 12:00-2:00pm

Credit points
10

Prerequisites
((MECH2005 or MECH205) and (MECH2003 or MECH203)) or admission to MEngMechEng

Corequisites

Co-badged status

Unit description
This unit examines modern and advanced manufacturing techniques for polymers, ceramics, composites and metal products. The unit covers knowledge in the details of manufacturing processes and their specific requirements for a range of engineering design applications. At the end of this unit, students are expected to demonstrate understandings in the advantages and disadvantages of different manufacturing processes, identify best manufacturing strategies for complex mechanical products and be aware of their cost implications.

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: Draw upon in-depth knowledge to critique and appraise manufacturing processes for different engineering materials.

ULO2: Integrate manufacturing processes including techniques of assemblies to produce complex engineering products.

ULO3: Apply knowledge in manufacturing post-treatment processes and the overall cost implications of manufacturing a complex engineering product.

ULO4: Apply and analyse the application of innovative manufacturing techniques.

General Assessment Information

A. Requirements to Pass this Unit

To pass this unit you must: Achieve a total mark equal to or greater than 50%

B. Late Assessment Submission Penalty:

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is **11:55 pm**. A 1-hour grace period will be provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for [Special Consideration](#).

Assessments where Late Submissions will be accepted

- Assessment: Lab report and Fieldtrip report – YES, Standard Late Penalty applies
- Assessment: In-class tests and final exam - NO, unless Special Consideration is Granted

C. Special Consideration

The [Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the convenor and submit a Special Consideration request through ask.mq.edu.au.

If you receive [special consideration](#) for the final exam, a supplementary exam will be scheduled by the faculty during a supplementary exam period, typically about 3 to 4 weeks after the normal exam period. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

D. Descriptions of Assessment Activities and other information

- There will be no SGTA in week 1, 7, and 13. All students are however required to attend at least 8 out of 10 SGTAs to receive 5% participation mark.
- There will be three compulsory practicals on Week 6, 7, and Week 11, respectively.
- There will be one-day compulsory fieldtrip in Week 7.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>In-class test</u>	30%	No	Week 4, Week 8, Week 12
<u>Fieldtrip Report</u>	20%	No	Week 9
<u>Final examination</u>	35%	No	TBA
<u>Lab report</u>	10%	No	Report I: Week 8; Report II: Week 12
<u>Participation in SGTA</u>	5%	No	N/A

In-class test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 30 hours

Due: **Week 4, Week 8, Week 12**

Weighting: **30%**

This assessment task includes three 30-min quizzes conducted during lecture hours. The quizzes will be held in week 4 (Week 1-3 lecture), Week 8 (Week 4-7 lectures), and Week 12 (Week 8-11 lectures).

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- Apply knowledge in manufacturing post-treatment processes and the overall cost implications of manufacturing a complex engineering product.
- Apply and analyse the application of innovative manufacturing techniques.

Fieldtrip Report

Assessment Type ¹: Report

Indicative Time on Task ²: 10 hours

Due: **Week 9**

Weighting: **20%**

This activity aims to help students understand real-work manufacturing techniques covered in the

lectures. Students are expected to submit a report and reflect on the core manufacturing activities they watched during the trip. This assessment task is compulsory.

On successful completion you will be able to:

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- Apply knowledge in manufacturing post-treatment processes and the overall cost implications of manufacturing a complex engineering product.
- Apply and analyse the application of innovative manufacturing techniques.

Final examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 40 hours

Due: **TBA**

Weighting: **35%**

The final examination will cover all the content taught in the unit.

On successful completion you will be able to:

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- Apply and analyse the application of innovative manufacturing techniques.

Lab report

Assessment Type ¹: Lab report

Indicative Time on Task ²: 10 hours

Due: **Report I: Week 8; Report II: Week 12**

Weighting: **10%**

This task is to help students to develop knowledge and skills in the design and manufacturing of a specific product. Students are expected to undertake different manufacturing activities and record these activities. Each student is required to submit two lab reports. Report I will cover the lab activities undertaken in Week 6-7 and Report II for lab activities in Week 11. These assessments aim to help reinforce student's learning by connecting the contents in lecture to real-world practices. This assessment task is compulsory.

On successful completion you will be able to:

- Draw upon in-depth knowledge to critique and appraise manufacturing processes for different engineering materials.
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- Apply knowledge in manufacturing post-treatment processes and the overall cost implications of manufacturing a complex engineering product.
- Apply and analyse the application of innovative manufacturing techniques.

Participation in SGTA

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 0 hours

Due: **N/A**

Weighting: **5%**

Development of knowledge and skills in engineering requires continual practice at authentic tasks. In each weekly SGTA class, you will undertake a range of relevant problems and discussion. Contribution to these tasks will be recorded by teaching staff to constitute this grade.

On successful completion you will be able to:

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- Apply knowledge in manufacturing post-treatment processes and the overall cost implications of manufacturing a complex engineering product.
- Apply and analyse the application of innovative manufacturing techniques.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

- **Delivery:** This unit will be presented in weekly (double) lectures; and in weekly SGTAs

(10 SGTAs, 3 pracs, 1 fieldtrip).

- **Textbook:** The following textbook is recommended, but not prescribed: **FUNDAMENTALS OF MODERN MANUFACTURING: Materials, Processes, and Systems** Mikell P. Groover 4th edition, Wiley
- **Methods of Communication:** We will communicate with you via your university email or through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to shuying.wu@mq.edu.au from your **university email** address.
- **COVID Information:** For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus-faqs>. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

Policies and Procedures

Macquarie University policies and procedures are accessible from **Policy Central** (<https://policies.mq.edu.au>). 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](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

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

To find other policies relating to Teaching and Learning, visit **Policy Central** (<https://policies.mq.edu.au>) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/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

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

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

The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the 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

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and

processes

Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

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

Learning activity: Fieldtrip is added; new practical activities included.

Assessment tasks: Fieldtrip report and practical reports are added.

Engineers Australia Competency Mapping

EA Competency Standard		Unit Learning Outcomes
Knowledge and Skill Base	1.1 Comprehensive, theory-based understanding of the underpinning fundamentals applicable to the engineering discipline.	ULO1 & ULO2 & ULO3 & ULO4
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.	
	1.3 In-depth understanding of specialist bodies of knowledge	ULO4
	1.4 Discernment of knowledge development and research directions	ULO1 & ULO2 & ULO3 & ULO4
	1.5 Knowledge of engineering design practice	
	1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice.	
Engineering Application Ability	2.1 Application of established engineering methods to complex problem solving	ULO1 & ULO2 & ULO3 & ULO4
	2.2 Fluent application of engineering techniques, tools and resources.	ULO1 & ULO2 & ULO3 & ULO4
	2.3 Application of systematic engineering synthesis and design processes.	
	2.4 Application of systematic approaches to the conduct and management of engineering projects.	

Professional and Personal Attributes	3.1 Ethical conduct and professional accountability.	ULO1 & ULO2 & ULO3
	3.2 Effective oral and written communication in professional and lay domains.	
	3.3 Creative, innovative and pro-active demeanour.	ULO4
	3.4 Professional use and management of information.	ULO1 & ULO2 & ULO3
	3.5 Orderly management of self, and professional conduct.	
	3.6 Effective team membership and team leadership	

Engineers Australia Competency Mapping