



MECH3005

Manufacturing Engineering

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Engineering

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General Information

Unit convenor and teaching staff

Course Convenor & Lecturer

Shuying Wu

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E6A, 320

Wednesday 3:00-5:00pm

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

1. There will be no tutorial in week 1, 7, and 13. All students are however required to attend at least 8 out of 10 tutorials to receive 5% participation mark.

2. There will be two practicals on Week 6 and Week 11, respectively.

3. Late submissions:

- Online quizzes, in-class activities, or scheduled tests and exam must be undertaken at the time indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration.
- All other assessments must be submitted by 5:00 pm on their due date.
- Should these assessments be missed due to illness or misadventure, students should apply for Special Consideration.
- Assessments not submitted by the due date will receive a mark in accordance with the late submission policy as follows: A 12-hour grace period will be given after which the following deductions will be applied to the awarded assessment mark: 12 to 24 hours late = 10% deduction; for each day thereafter, an additional 10% per day or part thereof will be applied until five days beyond the due date. After this time, a mark of zero (0) will be given. For example, an assessment worth 20% is due 5 pm on 1 January. Student A submits the assessment at 1 pm, 3 January. The assessment received a mark of 15/20. A 20% deduction is then applied to the mark of 15, resulting in the loss of three (3) marks. Student A is then awarded a final mark of 12/20.

4. 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.

5. 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.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>In-class test</u>	30%	No	Week 4 (16/Mar) Week 8 (27/April) Week 12 (25/May)
<u>Assignment 2</u>	10%	No	Week 13 (03/June, Friday)
<u>Final examination</u>	45%	No	TBC
<u>Assignment 1</u>	10%	No	Week 8 (29/April, Friday)
<u>Participation Marks</u>	5%	No	N/A

In-class test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 30 hours

Due: **Week 4 (16/Mar) Week 8 (27/April) Week 12 (25/May)**

Weighting: **30%**

The quiz is designed to help students with progressive learning and enhance students' understanding of the unit content that is delivered in the lecture. This Assessment Task is a 30-min quiz. In total, there are three monthly quizzes that will be conducted during lecture hours, starting from Week 4. Week 4 quiz will cover the course materials delivered in Week 1-3; Week 8 quiz will cover the content taught in Week 4-7; Week 12 quiz will include the course materials delivered in Week 8-11.

On successful completion you will be able to:

- Draw upon in-depth knowledge to critique and appraise manufacturing processes for different engineering materials.
- Integrate manufacturing processes including techniques of assemblies to produce complex engineering products.
- 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.

Assignment 2

Assessment Type ¹: Project

Indicative Time on Task ²: 10 hours

Due: **Week 13 (03/June, Friday)**

Weighting: **10%**

Assignment 2 will cover the content taught in Week 7-Week 11

On successful completion you will be able to:

- Draw upon in-depth knowledge to critique and appraise manufacturing processes for different engineering materials.
- Integrate manufacturing processes including techniques of assemblies to produce complex engineering products.
- 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: **TBC**

Weighting: **45%**

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

On successful completion you will be able to:

- Draw upon in-depth knowledge to critique and appraise manufacturing processes for different engineering materials.
- Integrate manufacturing processes including techniques of assemblies to produce complex engineering products.
- 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.

Assignment 1

Assessment Type ¹: Project

Indicative Time on Task ²: 10 hours

Due: **Week 8 (29/April, Friday)**

Weighting: **10%**

Assignment 1 will cover the content taught in Week 1-Week 5

On successful completion you will be able to:

- Draw upon in-depth knowledge to critique and appraise manufacturing processes for different engineering materials.
- Integrate manufacturing processes including techniques of assemblies to produce complex engineering products.
- 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 Marks

Assessment Type ¹: Participatory task

Indicative Time on Task ²: 0 hours

Due: **N/A**

Weighting: **5%**

Student Engagement with learning activities

On successful completion you will be able to:

- Draw upon in-depth knowledge to critique and appraise manufacturing processes for different engineering materials.
- Integrate manufacturing processes including techniques of assemblies to produce complex engineering products.
- 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

This unit will be presented in weekly (double) lectures; and in weekly workshops (10 Tutorials, 2 pracs). The following textbook is recommended, but not prescribed.

FUNDAMENTALS OF MODERN MANUFACTURING: Materials, Processes, and Systems Mikell P. Groover 4th edition, Wiley

Unit Schedule

Refer to iLearn and lecture notes for the unit schedule.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.mq.edu.au) (<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) (<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) (<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 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.

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	