MECH3005
Manufacturing Engineering
Session 1, In person-scheduled-weekday, North Ryde 2024
School of Engineering

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General Information

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Credit points
10

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

Corequisites

Co-badged status
Unit guide MECH3005 Manufacturing Engineering

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
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](http://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, 8, and Week 11, respectively.
- There will be one-day compulsory fieldtrip in Week 7.

## Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final examination</td>
<td>35%</td>
<td>No</td>
<td>Exam period</td>
</tr>
<tr>
<td>Fieldtrip Report</td>
<td>20%</td>
<td>No</td>
<td>Week 10</td>
</tr>
<tr>
<td>Participation in SGTA</td>
<td>5%</td>
<td>No</td>
<td>Weekly</td>
</tr>
<tr>
<td>In-class test</td>
<td>30%</td>
<td>No</td>
<td>Week 4, 8, 12</td>
</tr>
<tr>
<td>Lab report</td>
<td>10%</td>
<td>No</td>
<td>Week 9, 12</td>
</tr>
</tbody>
</table>

### Final examination

- **Assessment Type**: Examination
- **Indicative Time on Task**: 40 hours
- **Due**: Exam period
- **Weighting**: 35%
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.

Fieldtrip Report

Assessment Type: Report
Indicative Time on Task: 10 hours
Due: Week 10
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:

- 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 in SGTA

Assessment Type: Practice-based task
Indicative Time on Task: 0 hours
Due: Weekly
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:
- 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.

**In-class test**

Assessment Type: Quiz/Test  
Indicative Time on Task: 30 hours  
Due: Week 4, 8, 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).

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.

**Lab report**

Assessment Type: Lab report
Indicative Time on Task: 10 hours
Due: Week 9, 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.
- 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

- Delivery: This unit will be presented in weekly (double) lectures; and in weekly SGTAs (10 SGTAs, 3 prac, 1 fieldtrip).
- 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 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](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.

## Unit Schedule

Please refer to iLearn page.

## 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](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](mailto:ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/). The policy applies to all who connect to the MQ network including students.

### Changes from Previous Offering

No.

### Engineers Australia Competency Mapping

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<thead>
<tr>
<th>EA Competency Standard</th>
<th>Unit Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge and Skill Base</strong></td>
<td>ULO1 &amp; ULO2 &amp; ULO3 &amp; ULO4</td>
</tr>
<tr>
<td>1.1 Comprehensive, theory-based understanding of the underpinning fundamentals applicable to the engineering discipline.</td>
<td>ULO1 &amp; ULO2 &amp; ULO3 &amp; ULO4</td>
</tr>
<tr>
<td>1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.</td>
<td>ULO4</td>
</tr>
<tr>
<td>1.3 In-depth understanding of specialist bodies of knowledge</td>
<td>ULO4</td>
</tr>
<tr>
<td>1.4 Discernment of knowledge development and research directions</td>
<td>ULO1 &amp; ULO2 &amp; ULO3 &amp; ULO4</td>
</tr>
<tr>
<td>1.5 Knowledge of engineering design practice</td>
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<tr>
<td>1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice.</td>
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<tr>
<td><strong>Engineering Application Ability</strong></td>
<td>ULO1 &amp; ULO2 &amp; ULO3 &amp; ULO4</td>
</tr>
<tr>
<td>2.1 Application of established engineering methods to complex problem solving</td>
<td>ULO1 &amp; ULO2 &amp; ULO3 &amp; ULO4</td>
</tr>
<tr>
<td>2.2 Fluent application of engineering techniques, tools and resources.</td>
<td>ULO1 &amp; ULO2 &amp; ULO3 &amp; ULO4</td>
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<tr>
<td>2.3 Application of systematic engineering synthesis and design processes.</td>
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<tr>
<td>2.4 Application of systematic approaches to the conduct and management of engineering projects.</td>
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<tr>
<td><strong>Professional and Personal Attributes</strong></td>
<td>ULO1 &amp; ULO2 &amp; ULO3</td>
</tr>
<tr>
<td>3.1 Ethical conduct and professional accountability.</td>
<td>ULO1 &amp; ULO2 &amp; ULO3</td>
</tr>
<tr>
<td>3.2 Effective oral and written communication in professional and lay domains.</td>
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<tr>
<td>3.3 Creative, innovative and pro-active demeanour.</td>
<td>ULO4</td>
</tr>
<tr>
<td>3.4 Professional use and management of information.</td>
<td>ULO1 &amp; ULO2 &amp; ULO3</td>
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<tr>
<td>3.5 Orderly management of self, and professional conduct.</td>
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<tr>
<td>3.6 Effective team membership and team leadership</td>
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Unit information based on version 2024.01R of the Handbook