



MECH4005

Production Processes

Session 1, In person-scheduled-weekday, North Ryde 2025

School of Engineering

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General Information

Unit convenor and teaching staff

Unit convenor

June Ho

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Contact via june.ho@mq.edu.au

3MD, 246

Tuesdays 9-10am

Credit points

10

Prerequisites

MECH3005 and MECH3003

Corequisites

Co-badged status

Unit description

This unit covers the skills and knowledge in production processes. Students will learn and apply the fundamental principles and practices of just-in-time and lean production as well as six-sigma approach to competitive manufacturing and to optimise production processes. At the end of the unit, students are expected to demonstrate the ability to gather, analyse and apply data to plan, control and improve production processes, to manage and optimise production flow, and to apply mathematical science to design and refine product/service functionality and quality.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Industry, Innovation and Infrastructure; Responsible Consumption and Production

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: Convey fundamental knowledge of the just-in-time and lean production as well as six-sigma approach and how to apply it in planing, controlling, and optimising production

systems.

ULO2: Apply mathematical science to model and control production systems/flow.

ULO3: Design and refine product/service functionality and quality.

ULO4: Present and communicate engineering solutions for production processes effectively.

General Assessment Information

Requirements to pass the unit: To pass this unit you need to achieve a total mark equal to or greater than 50% across all assessments.

Attendance and participation: We strongly encourage all students to actively participate in all learning activities. Regular engagement is crucial for your success in this unit, as these activities provide opportunities to deepen your understanding of the material, collaborate with peers, and receive valuable feedback from instructors, to assist in completing the unit assessments. Your active participation not only enhances your own learning experience but also contributes to a vibrant and dynamic learning environment for everyone.

Late Assessment Submission and Penalties: The late submission policies adopted in this unit are in line with the general faculty's policy on assessment submission deadlines, including late submissions.

Assessments where Late Submissions will be accepted:

- Assessment: Fieldtrip report – YES, Standard Late Penalty applies (unless Special Consideration is Granted)
- Assessment: Quiz, presentation, and final exam - NO, unless Special Consideration is Granted

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](#).

Special Considerations:

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.

Descriptions of Assessment Activities and other information

Students are expected to receive the grades for their assessment submission between 2 to 4 weeks.

Quiz: The quiz must be submitted on iLearn. There are 2 quizzes in week 5 & 10.

Project: Students must read project introductions and study the marking rubrics to understand the expectations and requirements of this assessment task. Essentially, students are expected to present their project results to demonstrate their ability to apply concepts learned in this unit to a simple real-world problem. The PowerPoint presentation for the project must be submitted to iLearn.

Fieldtrip report: The instructions for the fieldtrip report can be found on iLearn. The report should be type-written. The report must be submitted on iLearn.

Marking rubrics for the Project and Fieldtrip report are explicitly stated in the assignment documents, with a clear description of what constitutes an F, P, CR, D and HD.

Participation: SGTA is a weekly event starting from week 1. Students' attendance will be marked. All students are required to attend at least 80% of SGTAs to receive 5% participation mark.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Participation in SGTA</u>	5%	No	Weekly
<u>Quizzes</u>	20%	No	Week 5, 10 (Sunday)
<u>Project 1</u>	15%	No	29/04/2025
<u>Project 2</u>	15%	No	03/06/2025
<u>Fieldtrip Report</u>	20%	No	11/05/2025
<u>Final examination</u>	25%	No	Exam period

Participation in SGTA

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 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:

- Convey fundamental knowledge of the just-in-time and lean production as well as six-sigma approach and how to apply it in planing, controlling, and optimising production systems.
- Apply mathematical science to model and control production systems/flow.
- Design and refine product/service functionality and quality.
- Present and communicate engineering solutions for production processes effectively.

Quizzes

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 20 hours

Due: **Week 5, 10 (Sunday)**

Weighting: **20%**

This Assessment Task includes two quizzes that cover lecture contents.

On successful completion you will be able to:

- Convey fundamental knowledge of the just-in-time and lean production as well as six-sigma approach and how to apply it in planing, controlling, and optimising production systems.
- Apply mathematical science to model and control production systems/flow.
- Design and refine product/service functionality and quality.
- Present and communicate engineering solutions for production processes effectively.

Project 1

Assessment Type ¹: Problem set

Indicative Time on Task ²: 13 hours

Due: **29/04/2025**

Weighting: **15%**

Assignment to reinforce skills or concept that is taught in class. This assignment requires students to work in a group to analyze a real-world problem and propose improvement alternatives.

On successful completion you will be able to:

- Convey fundamental knowledge of the just-in-time and lean production as well as six-sigma approach and how to apply it in planing, controlling, and optimising production systems.
- Apply mathematical science to model and control production systems/flow.
- Design and refine product/service functionality and quality.
- Present and communicate engineering solutions for production processes effectively.

Project 2

Assessment Type ¹: Problem set

Indicative Time on Task ²: 13 hours

Due: **03/06/2025**

Weighting: **15%**

Assignment to reinforce skills or concept that is taught in class. This assignment requires students to work in a group to analyze a real-world problem and propose improvement alternatives.

On successful completion you will be able to:

- Convey fundamental knowledge of the just-in-time and lean production as well as six-sigma approach and how to apply it in planing, controlling, and optimising production systems.
- Apply mathematical science to model and control production systems/flow.
- Design and refine product/service functionality and quality.
- Present and communicate engineering solutions for production processes effectively.

Fieldtrip Report

Assessment Type ¹: Report

Indicative Time on Task ²: 10 hours

Due: **11/05/2025**

Weighting: **20%**

This activity helps students to understand the modern manufacturing systems covered in the lectures. Students will learn how applicable their skills are to the different roles in an organization so they can visualize themselves in this field. Each student is expected to submit a report which gives them a chance to reflect on how the trip complements the class discussions and illustrates basic principles presented in the lectures. This assessment task is compulsory.

On successful completion you will be able to:

- Convey fundamental knowledge of the just-in-time and lean production as well as six-sigma approach and how to apply it in planing, controlling, and optimising production systems.
- Design and refine product/service functionality and quality.
- Present and communicate engineering solutions for production processes effectively.

Final examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 30 hours

Due: **Exam period**

Weighting: **25%**

Final examination will cover all the content taught in the unit.

On successful completion you will be able to:

- Convey fundamental knowledge of the just-in-time and lean production as well as six-sigma approach and how to apply it in planing, controlling, and optimising production systems.
- Apply mathematical science to model and control production systems/flow.
- Design and refine product/service functionality and quality.
- Present and communicate engineering solutions for production processes effectively.

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 lectures and workshops (Please refer to iLearn for details). All lectures are pre-recorded, and students are expected to watch the videos before attending each class.

1. Lectures will commence in week 2 and SGTA will commence in week 1.
2. There will be one-day compulsory fieldtrip in Week 7. There will be NO lecture and SGTA in week 7 (replaced by fieldtrip).

Textbook: The following textbook is recommended, but not prescribed.

1. **The Fundamentals of Production Planning and Control** (Stephen N. Chapman/ Pearson/Prentice Hall, 2006)
2. **Managing for Quality and Performance Excellence** (James R. Evans, William M. Lindsay, ISBN: 9780357442036)

Methods of Communication: We will communicate with you via your university email and through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to the unit convenor via the contact email on iLearn (june.ho@mq.edu.au).

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 the 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 site for details.

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 connect.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 the [Service Connect Portal](#), 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

We value student feedback to be able to continually improve the way we offer our units. As such we encourage students to provide constructive feedback via student surveys, to the teaching staff directly, or via the FSE Student Experience & Feedback link in the iLearn page. Student

feedback from the previous offering of this unit was very positive overall, with students pleased with the clarity around assessment requirements and the level of support from teaching staff. As such, no change to the delivery of the unit is planned, however we will continue to strive to improve the level of support and the level of student engagement.

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
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.	ULO1 & ULO2 & ULO3
	1.3 In-depth understanding of specialist bodies of knowledge	ULO3 & ULO4
	1.4 Discernment of knowledge development and research directions	
	1.5 Knowledge of engineering design practice	ULO4
	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	ULO2 & ULO3
	2.2 Fluent application of engineering techniques, tools and resources.	
	2.3 Application of systematic engineering synthesis and design processes.	ULO3 & ULO4
	2.4 Application of systematic approaches to the conduct and management of engineering projects.	ULO1
Professional and Personal Attributes	3.1 Ethical conduct and professional accountability.	
	3.2 Effective oral and written communication in professional and lay domains.	ULO3 & ULO4
	3.3 Creative, innovative and pro-active demeanour.	
	3.4 Professional use and management of information.	ULO1 & ULO2 & ULO3 & ULO4
	3.5 Orderly management of self, and professional conduct.	
	3.6 Effective team membership and team leadership	

Unit information based on version 2025.03 of the [Handbook](#)