



MECH4005

Production Processes

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

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Contact via shuying.wu@mq.edu.au

E6A, 320

Mondays 2-4pm

Credit points

10

Prerequisites

MECH3005 and (MECH3003 or MECH303)

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.

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

1. There will be no tutorial in week 1 and 7. The attendance to tutorial is not compulsory. All students are however required to attend at least 9 out of 11 tutorials to receive 5% participation mark.

2. 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.

3. 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.

4. 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
Final examination	45%	No	TBC
In-class quizzes	20%	No	Week 5, 21/March/2022; Week 11, 16/May/2022
Assignment 1	15%	No	Week 7, 22/April/2022
Assignment 2	15%	No	Week 12, 27/May/2022
Participation Marks	5%	No	N/A

Final examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 41 hours

Due: **TBC**

Weighting: **45%**

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.

In-class quizzes

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 30 hours

Due: **Week 5, 21/March/2022; Week 11, 16/May/2022**

Weighting: **20%**

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 two quizzes that will be conducted during lecture hours in Week 5

and Week 11. Week 5 quiz will cover the course materials delivered in Week 1-4; Week 11 quiz will cover the content taught in Week 7-10.

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.

Assignment 1

Assessment Type ¹: Problem set

Indicative Time on Task ²: 10 hours

Due: **Week 7, 22/April/2022**

Weighting: **15%**

Assignment to reinforce skills or concept that was taught in class. This assignment covers the content taught in Week 1-Week 5.

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.

Assignment 2

Assessment Type ¹: Problem set

Indicative Time on Task ²: 10 hours

Due: **Week 12, 27/May/2022**

Weighting: **15%**

Assignment to reinforce skills or concept that was taught in class. This assignment covers the

content taught in Week 7-Week 10.

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.

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:

- 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

This unit will be presented in weekly (double) lectures; and in weekly workshops (11 Tutorials). 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

Authors: James R. Evans, William M. Lindsay

ISBN: 9780357442036

Unit Schedule

Please refer to iLearn for more information.

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
	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	