

# MANF9544

Concurrent Product and Process Design

Term 1, 2022



## Course Overview

### Staff Contact Details

#### Convenors

Name	Email	Availability	Location	Phone
Shiva Abdoli	<a href="mailto:s.abdoli@unsw.edu.au">s.abdoli@unsw.edu.au</a>	Consultation concerning this course is available on Tuesday 13:00 –17:00 whenever the lecturer is not otherwise engaged.	Ainsworth Building (J17)	(02) 9385 6851

### School Contact Information

#### Location

UNSW Mechanical and Manufacturing Engineering

Ainsworth building J17, Level 1

Above Coffee on Campus

#### Hours

9:00–5:00pm, Monday–Friday\*

\*Closed on public holidays, School scheduled events and University Shutdown

#### Web

[School of Mechanical and Manufacturing Engineering](#)

[Engineering Student Support Services](#)

[Engineering Industrial Training](#)

[UNSW Study Abroad and Exchange](#) (for inbound students)

[UNSW Future Students](#)

#### Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

(+61 2) 9385 4097 – School Office\*\*

\*\*Please note that the School Office will not know when/if your course convenor is on campus or available

## Email

[Engineering Student Support Services](#) – current student enquiries

- e.g. enrolment, progression, clash requests, course issues or program-related queries

[Engineering Industrial Training](#) – Industrial training questions

[UNSW Study Abroad](#) – study abroad student enquiries (for inbound students)

[UNSW Exchange](#) – student exchange enquiries (for inbound students)

[UNSW Future Students](#) – potential student enquiries

- e.g. admissions, fees, programs, credit transfer

[School Office](#) – School general office administration enquiries

- NB: the relevant teams listed above must be contacted for all student enquiries. The School will only be able to refer students on to the relevant team if contacted

## Important Links

- [Student Wellbeing](#)
- [Urgent Mental Health & Support](#)
- [Equitable Learning Services](#)
- [Faculty Transitional Arrangements for COVID-19](#)
- [Moodle](#)
- [Lab Access](#)
- [Computing Facilities](#)
- [Student Resources](#)
- [Course Outlines](#)
- [Makerspace](#)
- [UNSW Timetable](#)
- [UNSW Handbook](#)

## Course Details

### Units of Credit 6

### Summary of the Course

This course introduces the core activities of concurrent development of products, processes, and manufacturing systems while various objectives are considered. Therefore, this course is a core part of the MEngSc program in Manufacturing Management and relates its contents to other courses in the program, such as Manufacturing Strategies, Managing Manufacturing Operations and Production Technologies. The need for companies to develop products that the customer wants and to do this in the shortest possible time has become one of the main success factors on the market. Concurrent Product and Process Development is one of the key strategies that address this problem of fast product development and customer satisfaction by taking into account economic and environmental objectives. It needs new techniques and design tools to be adopted, and it requires a change of the traditional departmental separation of tasks in a company.

### Course Aims

This course aims to provide an understanding of the integrative nature of the concurrent product and process development in a teamwork environment, and how it affects all subsequent activities in production. This course discusses the various methods and approaches that can be used for the concurrent development of products and processes in today's competitive and dynamic market condition.

### Course Learning Outcomes

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies
1. Describe the fundamental principles of the interdisciplinary field of concurrent product development.	PE1.3, PE1.5
2. Demonstrate critical thinking and problem solving in the context of collaborative and multi-disciplinary work.	PE2.3, PE3.6
3. Analyse change and change management and effectively communicate the challenges	PE2.3, PE3.6

### Teaching Strategies

The subject will be presented in the form of lectures and problem-solving classes. Weekly classes will consist of a 1.5-2 hrs lecture followed by a problem-solving class example or case study related to the material covered in the lecture.

## Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Online quiz	N/A	02/03/2022 11:00 PM	1, 2
2. Individual assignment	20%	16/03/2022 11:00 PM	1, 2, 3
3. Group Assignment	30%	30/03/2022 11:00 PM	1, 2, 3
4. Final Exam	50%	Not Applicable	1, 2, 3

### Assessment 1: Online quiz

**Start date:** 23/02/2022 05:00 PM

**Assessment length:** 8 questions

**Due date:** 02/03/2022 11:00 PM

**Deadline for absolute fail:** N/A

**Marks returned:** 1 week after submission

This is an online individual quiz that covers the delivered content in weeks 1 and 2 including the definitions and Time to the Market concept.

The quiz includes 8 multiple-choice questions.

This is not a Turnitin assignment

#### Assessment criteria

The Quiz include multiple-choice and true/false questions.

### Assessment 2: Individual assignment

**Start date:** 01/03/2022 09:00 PM

**Assessment length:** 1000 words

**Due date:** 16/03/2022 11:00 PM

**Deadline for absolute fail:** 2 weeks after the submission deadline

**Marks returned:** 2 weeks after submission deadline

This assignment allows students to apply the Quality Function Deployment method, covered in week 3, on a product.

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

#### Assessment criteria

It covers the Quality Function Deployment methods.

#### Additional details

This is an individual assignment.

### **Assessment 3: Group Assignment**

**Start date:** 15/03/2022 11:00 PM

**Assessment length:** 3000 words

**Due date:** 30/03/2022 11:00 PM

**Deadline for absolute fail:** 2 weeks after submission deadline

**Marks returned:** 2 weeks after submission deadline

This assignment covers the methods and concepts related to the Design for Assembly.

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

#### **Assessment criteria**

The students in a group of three to four can practice teamwork to do this assignment.

#### **Additional details**

This is a group assignment.

### **Assessment 4: Final Exam**

**Assessment length:** two hours

This is the final exam of the course. It covers the entire course content.

This is not a Turnitin assignment

#### **Assessment criteria**

It will be an online test including problem-solving questions, descriptive and multiple choice.

#### **Additional details**

The exam will happen in the exam period.

## Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

## Course Schedule

[View class timetable](#)

### Timetable

Date	Type	Content
O-Week: 7 February - 11 February		
Week 1: 14 February - 18 February	Lecture	Introduction and definitions
Week 2: 21 February - 25 February	Lecture	Product Development and Time-to-Market Concept
	Tutorial	Economic Trade-off Analysis in Product Development Exercise
Week 3: 28 February - 4 March	Lecture	Quality Function Deployment
	Tutorial	QFD Exercise
Week 4: 7 March - 11 March	Lecture	Design for Manufacture (DFM)
Week 5: 14 March - 18 March	Lecture	Design for Assembly (DFA) Modularization
	Tutorial	DFA Exercise
Week 6: 21 March - 25 March	Reading	Readings are provided for the flexibility week.
Week 7: 28 March - 1 April	Lecture	Systems Engineering Manufacturing System Design
	Tutorial	Assembly Sequence Generation Exercise
Week 8: 4 April - 8 April	Lecture	Design for Environment (DFE) Design for Reliability (DFR)
	Tutorial	Exercises of DFR and DFE
Week 9: 11 April - 15 April	Lecture	Rapid Prototyping

		Digitalization and Industry 4.0
Week 10: 18 April - 22 April	Lecture	Organization, Management, and Operating of CE Teams
	Tutorial	Problem Solving Teamwork Exercise



## Resources

### Prescribed Resources

Lecture material is suggested in Moodle for presented lectures.

### Recommended Resources

1. Thomas A. Salomone: "What every Engineer should know about CONCURRENT ENGINEERING", Marcel Dekker, 1995.
2. James L. Nevins, Daniel E. Whitney: "Concurrent Design of Products and Processes", A Strategy for the Next Generation in Manufacturing, McGraw-Hill Publishing Company, 1989. (good textbook but out of print)
3. Andrew Kusiak: "Concurrent Engineering", Automation, Tools, and Techniques, John Wiley & Sons Inc., 1993.
4. John Corbett, Mike Dooner, J. Meleka, C. Pym: "Design for Manufacture", Strategies, Principles, and Techniques, Addison-Wesley Publishing Company, 1991.
5. Paul G. Ranky: "Concurrent/Simultaneous Engineering", Methods, Tools and Case Studies.
6. CIMware Limited, Guildford, England, 1994. 7. Geoffrey Boothroyd, Peter Dewhurst, Winston Knight: "Product Design for Manufacture and Assembly", Marcel Dekker, 1994. 8. Geoffrey Boothroyd, Peter Dewhurst: "Product Design for Assembly", Handbook, Boothroyd Dewhurst Inc, 1991.

### Course Evaluation and Development

Feedback on the course is gathered periodically using various means, including the UNSW myExperience process, informal discussion in the final class for the course, and the School's Student/Staff meetings. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback. In this course, recent improvements resulting from student feedback include new lecture and tutorial content and updated assessment procedure.

# Submission of Assessment Tasks

## Assessment submission and marking criteria

Should the course have any non-electronic assessment submission, these should have a standard School cover sheet.

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with due respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

Marking guidelines for assignment submissions will be provided at the same time as assignment details to assist with meeting assessable requirements. Submissions will be marked according to the marking guidelines provided.

## Late policy

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of 20 percent (20%) of the maximum mark possible for that assessment item, per calendar day, for a minimum of zero marks.

The late penalty is applied per calendar day (or part thereof), including weekends and public holidays, that the assessment is overdue.

Work submitted after the 'deadline for absolute fail' is not accepted and a mark of zero will be awarded for that assessment item. For example:

- Your course has an assessment task worth a total of **30 marks (Max Possible Mark)**
- You submit the assessment **2 days after the due date**
- The assessment is marked as usual and achieves a score of **20 marks (Awarded Mark)**
- The late policy is applied using **Late Mark = Awarded Mark - (Days\*Penalty per Day)\*Max Possible Mark**. Your adjusted final score is **8 marks** ( $20 - ((2*0.2)*30)$ ).

For some assessment items, a late penalty may not be appropriate. These are clearly indicated in the course outline, and such assessments receive a mark of zero if not completed by the specified date. Examples include:

1. Weekly online tests or laboratory work worth a small proportion of the subject mark, or
2. Online quizzes where answers are released to students on completion, or
3. Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date, or
4. Pass/Fail assessment tasks.

## Examinations

You must be available for all quizzes, tests and examinations. For courses that have final examinations, these are held during the University examination periods: February for Summer Term, May for T1, August for T2, and November/December for T3.

Please visit myUNSW for Provisional Examination timetable publish dates. For further information on

exams, please see the [Exams](#) webpage.

## Special Consideration

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to submitting an assessment or sitting an exam.

UNSW now has a [Fit to Sit / Submit rule](#), which means that if you attempt an exam or submit a piece of assessment, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's [Special Consideration page](#).

**Please note** that students will **not** be required to provide **any** documentary evidence to support absences from any classes missed **because of COVID-19 public health measures such as isolation**. UNSW will **not** be insisting on medical certificates from anyone deemed to be a positive case, or when they have recovered. Such certificates are difficult to obtain and put an unnecessary strain on students and medical staff.

Applications for special consideration **will** be required for assessment and participation absences – but no documentary evidence **for COVID-19 illness or isolation** will be required.

## Special Consideration Outcomes

Assessments have default Special Consideration outcomes. The default outcome for the assessment will be advised when you apply for Special Consideration. Below is the list of possible outcomes:

<b>Outcome</b>	<b>Explanation</b>	<b>Example</b>
Time extension	Student provided more time to submit the assessment	e.g. 1 more week of time granted to submit a report
Supplementary assessment	Student provided an alternate assessment at a later date/time	e.g. a supplementary exam is scheduled during the supplementary exam period of the term
Substitute item	The mark for the missed assessment is substituted with the mark of another assessment	e.g. mark for Quiz 1 applied also applied as mark for Quiz 2, meaning if a student achieved a mark of 20/30 for Quiz 1 and was granted Special Consideration for Quiz 2, a mark of 20/30 would be applied for Quiz 2, etc
Exemption	All course marks are recalculated excluding this assessment and its weighting	e.g. The course has an assessment structure of: - Assignments 30%, - Lab report 30%, - Final Exam 40%. If the Lab report is missed and student is granted Special Consideration, then the assessment structure may be reweighted as follows: - Assignments 50% - Final Exam 50% as though the Lab report did not exist
Non-standard	Course Coordinator is contacted for the outcome when special consideration is granted as the outcome differs on a case-by-case basis	e.g. typical for group assessments where time extension supplementary assessment could be granted to the group member, time extension could be granted to the whole group, etc. Clarify with your Course Convenor for

## Academic Honesty and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism, visit: [student.unsw.edu.au/plagiarism](http://student.unsw.edu.au/plagiarism). The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

If plagiarism is found in your work when you are in first year, your lecturer will offer you assistance to improve your academic skills. They may ask you to look at some online resources, attend the Learning Centre, or sometimes resubmit your work with the problem fixed. However more serious instances in first year, such as stealing another student's work or paying someone to do your work, may be investigated under the Student Misconduct Procedures.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis) even suspension from the university. The Student Misconduct Procedures are available here:

[www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf](http://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf)

## Academic Information

### Credit points

Course credit is calculated in Units-Of-Credit (UOC). The normal workload expectation for one UOC is approximately 25 hours per term. This includes class contact hours, private study, other learning activities, preparation and time spent on all assessable work.

Most coursework courses at UNSW are 6 UOC and involve an estimated 150 hours to complete, for both regular and intensive terms. Each course includes a prescribed number of hours per week (h/w) of scheduled face-to-face and/or online contact. Any additional time beyond the prescribed contact hours should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations.

### On-campus class attendance

**\*\*T1-2022 UPDATE\*\***

Public distancing conditions must be followed for all face-to-face classes. To ensure this, only students enrolled in those classes will be allowed in the room. No over-enrolment is allowed in face-to-face classes. Students enrolled in online classes can swap their enrolment from online to on-campus classes by Sunday, Week 1. Please refer to your course's Microsoft Teams and Moodle sites for more information about class attendance for in-person and online class sections/activities.

Your health and the health of those in your class is critically important. You must stay at home if you are sick or have been advised to self-isolate by [NSW health](#) or government authorities. Current alerts and a list of hotspots can be found [here](#). **You will not be penalised for missing a face-to-face activity due to illness or a requirement to self-isolate.** We will work with you to ensure continuity of learning during your isolation and have plans in place for you to catch up on any content or learning activities you may miss. Where this might not be possible, an application for fee remission may be discussed. Further information is available on any course Moodle or Teams site.

In certain classroom and laboratory situations where physical distancing cannot be maintained or there is a high risk that it cannot be maintained, face masks will be considered **mandatory PPE** for students and staff.

For more information, please refer to the FAQs: <https://www.covid-19.unsw.edu.au/safe-return-campus-faqs>

### Guidelines

All students are expected to read and be familiar with UNSW guidelines and policies. In particular, students should be familiar with the following:

- [Attendance](#)
- [UNSW Email Address](#)
- [Special Consideration](#)
- [Exams](#)
- [Approved Calculators](#)

- [Academic Honesty and Plagiarism](#)

## **Image Credit**

Photo by Stephen Blake March 2017, Willis Annexe (J18) Thermofluids lab

## **CRICOS**

CRICOS Provider Code: 00098G

## **Acknowledgement of Country**

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.

## Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

<b>Program Intended Learning Outcomes</b>	
Knowledge and skill base	
PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	✓
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	
PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline	✓
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline	
Engineering application ability	
PE2.1 Application of established engineering methods to complex engineering problem solving	
PE2.2 Fluent application of engineering techniques, tools and resources	
PE2.3 Application of systematic engineering synthesis and design processes	✓
PE2.4 Application of systematic approaches to the conduct and management of engineering projects	
Professional and personal attributes	
PE3.1 Ethical conduct and professional accountability	
PE3.2 Effective oral and written communication in professional and lay domains	
PE3.3 Creative, innovative and pro-active demeanour	
PE3.4 Professional use and management of information	
PE3.5 Orderly management of self, and professional conduct	
PE3.6 Effective team membership and team leadership	✓