UNSW SYDNEY | Australia's Global University

Mechanical and Manufacturing Engineering

Course Outline

Term 3 2019

MANF9420

OPERATIONS AND SUPPLY CHAIN MANAGEMENT IN ENGINEERING

Contents

1. Staff contact details

Contact details and consultation times for course convenor

Name: Dr Maruf Hasan
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Consultation time on Tuesdays between 2:00 and 5:00 pm.

Contact details and consultation times for additional lecturers/demonstrators/lab staff

Please see the course Moodle.

2. Important links

- Moodle
- Lab Access
- Computing Facilities
- Student Resources
- Course Outlines
- Engineering Student Support Services Centre
- Makerspace
- UNSW Timetable
- UNSW Handbook
- UNSW Mechanical and Manufacturing Engineering

3. Course details

Credit points

This is a 6 unit-of-credit (UoC) course, and involves **3** hours per week (h/w) of face-to-face contact.

The UNSW website states “The normal workload expectations of a student are approximately 25 hours per semester for each UoC, including class contact hours, other learning activities, preparation and time spent on all assessable work. Thus, for a full-time enrolled student, the normal workload, averaged across the 16 weeks of teaching, study and examination periods, is about 37.5 hours per week.”

This means that you should aim to spend about 9 h/w on this course. The additional time should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations.

Contact hours

	Day	Time	Location
Lectures	Wednesday	18.00 – 20.00	Ainsworth 102
Demonstrations	Wednesday	20.00 – 21.00	Ainsworth G01 Ainsworth 101

Please refer to your class timetable for the learning activities you are enrolled in and attend only those classes.

Summary and Aims of the course

This course aims to provide both the strategic vision required to be effective as an operations and logistics manager and enough detail to allow you to learn about and apply the analytic tools and systems which support the vision. While some of the units cover topics common to other courses in the master program; you will find the ideas often described in terms of systems, processes, and customer focus. You will be provided an abundance of cases and examples to illustrate the concepts and demonstrate to you that what you learn is not just theory, but important perspectives on real world manufacturing practices.

To succeed in the global marketplace for now and in the future, organisations will have to operate according to the emerging developments in the manufacturing management area by considering:

a) A total commitment to continually increasing value for customers, investors, and employees.
b) A firm understanding that market-driven means that quality is defined by customers, not the company.
c) A commitment to leading people with a bias for continuous improvement and communication.
d) A recognition that sustained growth requires the simultaneous achievement of customer satisfaction, cost leadership, effective human resources, flexibility and integration with the supplier base.
e) A commitment to fundamental improvement through knowledge, skills, problem solving and teamwork.

Companies that develop these characteristics will be those that fully implement the principles of manufacturing management through simultaneously improving both quality and productivity on a continual basis.

Accordingly, this course complements your knowledge that is gained in different disciplines, programs and courses and will equip you with the fundamental methodologies, modelling and analysis skills for the design and implementation of supply chain networks across a wide range of applications. It is designed to help you to learn how to take a broad managerial perspective emphasizing the strategic impact of decisions and the interfaces between

operations and the other functional areas of the organization. It is aimed at providing you with an opportunity to apply their engineering knowledge in a real industry environment.

Student learning outcomes

This course is designed to address the learning outcomes below and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

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

Learning Outcome		**EA Stage 1 Competencies**
1.	Analyse concepts such as the development of supply chain, integration and distribution strategies and interrelationships and value in highly responsive and flexible supply chains.	PE1.1, PE1.3, PE1.6
2.	Critically evaluate the key theories, concepts, tools and techniques in the fields of supply chain management and operations.	PE1.1, PE1.3, – PE1.6
3.	Explain, analyse and discuss the concepts and methods of network planning, strategic inventory and global sourcing models and strategies.	PE1.1, PE1.3, PE1.6
4.	Further enhance problem-solving, inter-personal and critical thinking capabilities	PE3.2, PE3.3, PE3.4, PE3.6

4. Teaching strategies

Lectures and problem-solving sessions are designed to cover the core knowledge areas of the course to help you develop a range of skills towards several Graduate Attributes set in the section above by creating an environment where information sharing, discussions, groupwork, communication, task completions will take place. Since each of you may have come from a different professional and academic background, your experiences are drawn on to illustrate various aspects of cases covered, and this helps to increase motivation and engagement. Lectures and problem-solving sessions do not simply reiterate the texts but build on the real-life applications using examples and cases taken directly from industry to show how the theory is applied in practice and the details of when, where and how it should be applied.

You will be provided with feedback and discussion on the assignments so that concepts and problems are analysed in greater depth. It is expected that assignments will be marked within two weeks. You will have continuous feedback from your lecturers and discussions throughout the problem-solving sessions, all aiming to improve your learning experience.

An informal, participative teaching and learning approach is adopted in this course. Comprehensive understanding of the concepts is followed by numerous real-life case study

analysis and discussions. Teamwork is essential and “thinking aloud” is encouraged in the class. You need to cover the chapters and case studies assigned for each week prior to coming to classes so that the full advantage of “scenario” or “case-based” discussions, presentations and accordingly better learning will be achieved.

Several real-life manufacturing and service case studies will be covered to support the materials taught. Critical thinking activities, group discussions and presentations, assignments and class exercises which will be assigned as individual and/or teamwork aim to encourage review, stimulate additional thought, promote discussion and facilitate further enhancement of concepts covered.

5. Course schedule

Week	**Lecture Topics (chapters from the textbook)**	**Demonstration content and Case assignment**
1	Understanding the supply chain. (Ch 1)	Video Clips
2	Designing distribution networks (Ch 4)	Discussion questions: 1,3 and 5 (Ch 1)
3	Network design in the supply chain (Ch 5)	Discussion questions: 1,2,5,7 (Ch 4)
4	Designing global supply chain networks (Ch 6)	Discussion questions: 1,2,6 (Ch 5)
5	Aggregate planning (Ch 8)	Discussion questions: 1,3,6; Case 2 (Ch 6)
6	Planning supply and demand in a supply chain (Ch 9) Mid-semester Test	Discussion questions: 1,3,4,9 (Ch 8)
7	Coordination in a supply chain (Ch 10)	Discussion questions: 2,5,8,9 (Ch 9)
8	Managing economies of scale: cycle inventory (Ch 11)	Discussion questions: 1,4,6,8 (Ch 10);
9	Transportation and sourcing decision in a supply chain (Ch 14 & 15)	Discussion questions: 1,4,7 (Ch 11) Case 3
10	Sustainability and the supply chain (Ch 17)	Discussion questions: 1,3,6 (Ch 14) and 1,2,5 (Ch 15)

*The schedule shown above may be subject to change at short notice to suit exigencies.

6. Assessment

Assessment overview

Assessment	Group Project	Length	Weight	Learning outcomes assessed	Assessment criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
Individual project	No	5000 words	25%	1,2,3,4	Conceptual and Report writing skills	Week 4: Project released Week 10: Submission of final report (electronically)	Week 10	Two weeks after submission
Team based case discussions	Yes(5)	2000 words	15%	1,2,3,4	Conceptual and Report writing skills	Throughout the semester	N/A	Two weeks after submission
Mid-term test	No	1 hour	20%	1,2,3	Lecture material from weeks 1-4	Week 5		Two weeks
Final exam	No	2 hours	40%	1, 2 and 3	All course content from weeks 5-10 inclusive.	Exam period, date TBC	N/A	Upon release of final results

You will be assessed through a final exam, demonstration activities, team-based case discussions and an individual project.
Teams will be formed to discuss and present the case studies and class exercises, which help to illustrate many of the concepts covered in the course.

The role of the teaching staff is to support the learning/teaching process through discussions carried out both in teams and individually as well as providing direction in further understanding of the course material and assessing your participation and progress in face-to-face and electronic discussions.

Assignments

The details of individual projects will be provided in Week 4.

Presentation

All submissions should have a standard School cover sheet, which is available from this course's Moodle page.

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.

The preferred set-out of any numerical calculation is similar to the following:

$\Delta = \rho\nabla$	(Equation in symbols)
$= 1.025 \square 200$	(Numbers substituted)
$= 205$ t	(Answer with units)

Submission

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.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day.

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

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:

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

Criteria for grading assignments

The following criteria will be used to grade assignments:

- Identification of key facts and the integration of those facts in a logical development.

- Clarity of communication - this includes development of a clear and orderly structure and the highlighting of core arguments.
- Sentences in clear and plain English - this includes correct grammar, spelling and punctuation.
- Correct referencing in accordance with the prescribed citation and style guide. Please refer to the Academic Honesty and Plagiarism section of this document.

All assessments other than the mid-semester test and final exam will be returned to you either in-class or over email.

Marking

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.

Examinations

The Mid-term test will include all material covered up to and including week 4.
The Final Exam will include all course content from week 5 to 10 inclusive.

You must be available for all tests and examinations. Final examinations for each course are held during the University examination periods: February for Summer Term, May for T!, 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.

Calculators

You will need to provide your own calculator, of a make and model approved by UNSW, for the examinations. The list of approved calculators is shown at student.unsw.edu.au/exam-approved-calculators-and-computers

It is your responsibility to ensure that your calculator is of an approved make and model, and to obtain an “Approved” sticker for it from the Engineering Student Supper Services Centre prior to the examination. Calculators not bearing an “Approved” sticker will not be allowed into the examination room.

Special consideration and supplementary assessment

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.

Please note that UNSW now has a Fit to Sit / Submit rule, which means that if you sit 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.

7. Expected resources for students

Prescribed text

Chopra, S., and Meindl, P., Supply Chain Management: Strategy, Planning and Operation, Prentice Hall, 7th Edition, 2019

Supplementary Text

Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E., Designing and Managing the Supply Chain, 3rd edition, McGraw Hill.

If you wish to explore any of the lecture topics in more depth, then other resources are available and assistance may be obtained from the UNSW Library.

UNSW Library website: https://www.library.unsw.edu.au/

This course uses UNSW Moodle, where you will find a list of assignments, answers to some of the numerical questions and case studies.

Moodle: https://moodle.telt.unsw.edu.au/login/index.php

8. 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 the changes in the number and nature of assessments as well as more real-life case studies, and in-depth analysis of these cases and hands-on exercises. Accordingly, this term all of these suggestions are incorporated into the course syllabus.

9. 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. 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

10. Administrative matters and links

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

- Attendance
- UNSW Email Address
- Computing Facilities
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Disability Support Services
- Health and Safety
- Lab Access

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers

	Program Intended Learning Outcomes
PE1: Knowledge and Skill Base	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice
	PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice
PE2: Engineering Application Ability	PE2.1 Application of established engineering methods to complex 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
PE3: Professional and Personal Attributes	PE3.1 Ethical conduct and professional accountability
	PE3.2 Effective oral and written communication (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