Course Outline

MATS6004

Materials Industry Management

Materials Science and Engineering

Science

T2, 2020

1. Staff

Position	Name	Email	Consultation times and locations
Course Convenor	Dr Owen Standard	o.standard@unsw.edu.au	Consultation by appointment, please email for appointment. Can consult by phone or online by MS-Teams.
Course Convenor	Professor Johannes le Coutre	johannes.lecoutre@unsw.edu.au	Consultation by appointment, please email for appointment. Can consult by phone or online by MS-Teams.

External Presenters

- Ms Katherine Pick, UNSW Student Academic and Career Success
- Ms Fiona Woolliscroft, MCIC, UNSW Founders Program, UNSW Division of Enterprise
- Prof. Massimiliano Tani, School of Business, UNSW Canberra
- Ms Maria Nguyen, Professionals Australia

2. Course information

Units of credit: 6

Pre-requisite(s): None

Timetabling website: http://timetable.unsw.edu.au/2020/MATS6004.html

Teaching times and locations:

	Lecture	Lecture (Management Research Topic)*
Day	Wednesday	Friday
Time	3:00–6:00 pm	1:00–2:00 pm
Weeks[#]	1-5, 7-10	1, 3, 5, 7, 9
Location	Online	Online

*This lecture time is used in weeks 1, 3, 5, 7, and 9 specifically for online class discussion of the Management Research Topics for MATS6004 (see 4. Course Schedule and Structure) as well as being available in other weeks for group work, self-study, consultation with lecturers, etc.

[#]Week 6 is mid-term recess (no classes).

2.1 Course summary

Career Development: self-promotion to gain employment; engineering/graduate attributes; development of job applications and resumes; job searching, networking and career/employment perspectives; technical management; professional ethics. **Innovation and Entrepreneurship:** market analysis; marketing concepts; business viability principles, business models; competitive advantage and rapid research; knowledge exchange, intellectual property, channels to market: lean canvas product development. **Economics**: economic rationality, opportunity costs, sunk costs; economic modelling; trade and comparative advantage; supply and demand, elasticity, basic macroeconomics. **Project Management:** the stages of a project; planning; scheduling; personal dynamics; reporting; stakeholders; development of a project plans. **Risk Management:** concepts of risk and risk management; organisational risk management; systematic risk management process.

2.2 Course aims

To provide students with a working knowledge of selected important management and business issues they will encounter in the materials engineering and chemical engineering workplace, as well as gain an in-depth understanding of:

- Identify and specify key features pertaining to career development and professional issues for engineering graduates.
- Apply strategic business analysis principles to engineering business situations.
- Develop understanding of basic economic principles and application of these to real business situations, innovation, entrepreneurship, etc.
- Undertake project management and risk management
- Understand innovation and commercialisation principles and identify opportunities for product development.

2.3 Course learning outcomes (CLO)

At the successful completion of this course you (the student) should be able to:

1. Identify and specify ley features pertaining to career development and professional issues for engineering graduates.
2. Develop working understanding of economic and accounting principles and application of these to real business situations.
3. Be able to apply marketing and strategic business analysis principles to engineering business situations.
4. Be able to undertake in-depth project management.
5. Be able to undertake risk management and process resilience engineering.
6. Understand innovation and commercialisation principles and identify opportunities for product development.

2.4 Relationship between course and program learning outcomes and assessments

Course Learning Outcome (CLO)	LO Statement	Program Learning Outcome (PLO)	Related Tasks & Assessment
CLO 1	Identify and specify ley features pertaining to career development and professional issues for engineering graduates.	1.5, 2.3, 2.4, 3.1, 3.2 & 3.5	1
CLO 2	Develop working understanding of economic and accounting principles and application of these to real business situations.	1.5	2 & 4
CLO 3	Be able to apply marketing and strategic business analysis principles to engineering business situations.	1.5 & 2.4	2 & 4
CLO 4	Be able to undertake in-depth project management.	1.6 & 2.4	3 & 4
CLO 5	Be able to undertake risk management and process resilience engineering.	1.5, 1.6 & 2.4	3 & 4
CLO 6	Understand innovation and commercialisation principles and identify opportunities for product development.	2.4	2

3. Strategies and approaches to learning

3.1 Learning and teaching activities

(Based on UNSW Learning Guidelines)

- *Students are actively engaged in the learning process.*

It is expected that, in addition to attending online classes, students will read, write, discuss, and engage in analysing the course content.

- *Effective learning is supported by a climate of inquiry where students feel appropriately challenged.*

Students are expected to be challenged by the course content and to challenge their own preconceptions, knowledge, and understanding by questioning information, concepts, and approaches during class and study.

- *Learning is more effective when students' prior experience and knowledge are recognised and built on.*

Coursework, tutorials, assignments, group-work, and other forms of learning and assessment are intended to provide students with the opportunity to cross-reference these activities in a meaningful way with their own experience and knowledge.

- *Students become more engaged in the learning process if they can see the relevance of their studies to professional and disciplinary contexts*

The course content is designed to incorporate both theoretical and practical concepts, where the latter is intended to be applicable to real-world situations and contexts.
Online lectures: The core concepts will be taught in lectures, students will have access to the lecture notes and lecture recordings shortly before or after class. Students will be engaged in the learning process through class discussions and problem-solving questions independently and working together with partners and groups. Most online lectures will be recorded and made available in Moodle afterwards.

3.2 Expectations of students

- The course is being delivered fully online. Students are expected to engage with the course in a regular manner whether this be the online live lectures, class activities, group work, or assessments. An underlying core aspect of the course is the recognition of personal/graduate/professional attributes and for students to practice and develop these in completing this course.
- Students must attend at least 80% of all online classes with the expectation that students only miss classes due to illness or unforeseen circumstances.
- Students must read through lecture notes and associated with online classes.
- During class, students are expected to engage actively in online class discussions and activities.
- Students should work collaboratively with group members to complete group assessments.
- Students should complete all assessment tasks and submit them on time.
- Students are expected to participate in online discussions in online classes and through the Moodle page.

4. Course schedule and structure

This course consists of 27 hours (3 hpw for 9 weeks) of online class contact hours shown below. You are expected to take an additional 54 hours of non-class contact hours during the term to undertake group meetings, research, and complete assessment tasks. An additional 10 hours (1 hpw for 10 weeks) is allocated in the timetable for the Management Research Topic (in Weeks 1, 3, 5, 7, 9) and for student group work and meetings, consultation, etc. The course schedule is shown below (please note that the schedule is subject to change depending upon the availability of external presenters).

Week	Date	Topics (3–6 pm Wednesday)	Activity
1	3 June	**Course Introduction and Objectives** (OS + JLC) **Engineering/Professional Competencies**: Graduate + engineering competencies (OS) **Career Development:** Career development model; identification of skills, interests, and values; Development of personal brand statement. (KP) **Group Dynamics Theory:** Identification of student roles and skillsets, formation of effective groups. (OS)	**Assessment Task: Management Research Topic (10%)** Formation of groups (for project-based work in the course). Peer assessment of skills.
2	10 June	**Innovation and Entrepreneurship Pt 1:** creativity and design thinking; rapid research; user persona and problem statements, creating solutions. (FW)	Identification of problems, construction of problem statements.
3	17 June	**Innovation and Entrepreneurship Pt 2:** Business Viability Principles and Practices; Lean Business Principles; Lean Canvas Development (FW)	Lean canvas development **Assessment Task: Business Case – Pt 1 Lean Canvas Development (25%)**
4	24 June	**Project Management Pt 1** (OS)	Development of project team roles, scope and constraints for current project.
5	1 July	**Project Management Pt 2** (OS)	Develop WBS, schedule, and resources statement for current project. **Assessment Task: Project Management Plan (25%)**
6	8 July	**Mid-term Recess**	
7	15 July	**Economics:** Economic drivers of innovation, measurement of innovation; Dependence of innovation and productivity on mobility and interaction (incl. effect of COVID-19); Risk appetite and effect of market size. (MT)	Fundamentals of business case development and video pitch training (self- learning). **Assessment Task: Business Case – Pt 2 Complete Project Proposal and Video Pitch (25%)**
8	22 July	**Intellectual Property and Commercialisation** (JLC)	
9	29 July	**Risk Management** (OS)	**Assessment Task: Risk Assessment (15%)**
10	5 July	**Professional Issues for Students & Graduates** (MN) **Technical Management and Graduate Attributes** (JLC) **Course Summary** (OS + JLC)	

Presenters: Owen Standard (OS), Johannes le Coutre (JLC), Katherine Pick (KP), Ms Fiona Woolliscroft (FW), Massimiliano Tani (MT), Maria Nguyen (MN)

5. Assessment

5.1 Assessment tasks

Assessment task	Description	Weight	Due date
Management Research Topic (Individual Work Only)	Students are to research one selected management topic and to prepare a report concisely summarising the management theory underlying the topic and to evaluate current management practices. Topics and details of the assessment requirements are provided separately. The report will be submitted for assessment (to Moodle in PDF format). The topics will be examined in **online class discussions** in Weeks 3, 5, 7, and 9 (in the 1-2pm Fri. timeslot).	10% (individual mark)	End of Week 3
Business Case (Groups of 5 max.)	**Part 1 Lean Canvas Development:** A selection of business scenarios/problems will be provided (students can also suggest their own for approval by course coordinator). Each group should choose one scenario and conduct any business analyses you consider appropriate to identify the viability of such an operation. This will include statement of the problem, potential solutions, unique value proposition, target customers/markets, cost structure etc. You should make and justify a recommendation (either to proceed or not proceed). Your analyses should draw conclusions of the viability of the operation in the context of the Australian market. Specific details of the assessment task will be provided separately.	25% (group mark*)	End of Week 4
	Part 2 Complete Case and Pitch: For the lean canvas developed in Business Case – Pt 1, students will develop this into a coherent written business case and prepare a group video to present their work. The Business Case Assignment and Pitch is intended to utilise any/all aspects of the course material and serves to integrate understanding of the course content. Specific details of the assessment task will be provided separately.	25% (individual mark)	End of Week 11
Project Management Plan (Groups of 5 max.)	For the business scenario/problem in the *Lean Canvas Business Case* you develop a detailed project management plan for its implementation. Specific details of the assessment task will be provided separately. Specific details of the assessment task will be provided separately.	25% (group mark*)	End of Week 7
Risk Assessment (Individual Work Only)	For the business scenario/problem in the *Lean Canvas Business Case* you are required to identify the various risks to it and their causes, perform a risk analysis to determine the risk rating (consequence x likelihood), and finally recommend control measures/treatments to reduce the risks to acceptable levels. Specific details of the assessment task will be provided separately.	15% (individual mark)	End of Week 10

*group mark will be modulated by formal peer assessment.

Further information
UNSW grading system: https://student.unsw.edu.au/grades
UNSW assessment policy: https://student.unsw.edu.au/assessment

5.2 Assessment criteria and standards

The assessment criteria and standards will be available on the course Moodle page.

5.3 Submission of assessment tasks

- UNSW operates under a Fit to Sit/ Submit rule for all assessments. If a student wishes to submit an application for special consideration for an exam or assessment, the application must be submitted prior to the start of the exam or before an assessment is submitted. If a student sits the exam/ submits an assignment, they are declaring themselves well enough to do so. Information on this process can be found here: https://student.unsw.edu.au/special-consideration. Medical certificates or other appropriate documents must be included. Students should also advise the course coordinator of the situation.
- Unless otherwise specified in the task criteria, all assignments must be uploaded via Moodle prior to the due date for submission.
- Assignments submitted after the due date for submission will receive a 20% of maximum grade penalty for every day late, or part thereof. Work which is more than 5 days late will not be accepted and will be awarded zero marks.
- Students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course coordinator prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit: https://student.unsw.edu.au/disability. Early notification is essential to enable any necessary adjustments to be made.

5.4. Feedback on assessment

Assignments: Feedback will be given two weeks after submission of the assignment and take the form of the mark for the assignment, overall comments on how the class performed, any common areas that were not answered correctly. Additionally, personal feedback and how each student performed may be given. Feedback will be provided through Moodle, within two weeks after submission.

5.5. Course Attendance

Students are required to attend at least 80% of online classes otherwise a course grade of **Unsatisfactory Fail (UF)** will be awarded regardless of the mark achieved. Attendance may be taken in selected online classes and absence from more than 2 online classes will be taken as an indication that less than 80% of the online classes have been attended. Please refer to the UNSW guide to grades: https://student.unsw.edu.au/grades

6. Academic integrity, referencing and plagiarism

Referencing system: Harvard, please see the following site for details of the refencing system: https://student.unsw.edu.au/harvard-referencing

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at https://student.unsw.edu.au/referencing

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits**:** honesty, trust, fairness, respect, responsibility and courage.[1] At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and **plagiarism** can be located at:

- The *Current Students* site https://student.unsw.edu.au/plagiarism**,** and
- The *ELISE* training site http://subjectguides.library.unsw.edu.au/elise/presenting

The *Conduct and Integrity Unit* provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct.

7. Readings and resources

- Frank and Bernanke 2004, Microeconomics. McGraw Hill. Second Edition
- Heineke, J.M. 1976, *Microeconomics for Business Decisions,* Prentice-Hall, New Jersey.
- Heyne, P. 1991, sixth edition, *The Economic Way of Thinking,* Science Research Associates, Chicago.
- Quirk, J.P. 1982, second edition, *Intermediate Microeconomics,* Science Research Associates, Chicago.
- Riggs, J.L. 1986, second edition, *Engineering Economics,* McGraw-Hill, New York.
- Blank, L.T. and Tarquin, A.J. 1989, Third edition, *Engineering Economy,* McGraw-Hill, New York.
- Mansfield, E. 1991, seventh edition, *Microeconomics,* Norton, New York.
- Mishan, E.J. 1982, 3rd ed, *Cost-Benefit Analysis,* George Allen and Unwin, London.
- Stegman, T. and Junor, C.W. 1993, *Introductory Macroeconomics,* Harcourt Brace, Sydney.
- Articles selected by specific topic from the following serials:
- *Student Economic Briefs,* Clark, David 1991+, annual, Australian Financial Review Library, John Fairfax, Sydney.
- P. Kotler, P. Chandler, R. Gibbs, and R. McColl, *Marketing in Australia*, 2nd Edition, Prentice-Hall, New York, 1989.
- E.J. McCarthy and W.D. Perreault, *Basic Marketing - A Managerial Approach*, Irwin, 9th Edition, 1987
- Theodore Levitt, *The Marketing Imagination*, Free Press, New York, 1986
- D. Midgley and G. Wills, Eds. *Marketing Management*, MCB Limited, Bradford, 1977
- M.J. Baker and Susan J. Hart, *Marketing and Competitive* Success, P. Allan, New York, 1989
- R. Heller, The Naked Market: Marketing Methods for the 80s, Sidgwick & Jackson, London, 1984
- Insights into Australian Marketing: Readings and Cases, Prentice-Hall, New York, 1990

8. Administrative matters

School Office: Room 137, Building E10 School of Materials Science and Engineering
School Website: http://www.materials.unsw.edu.au/
Faculty Office: Robert Webster Building, Room 128
Faculty Website: http://www.science.unsw.edu.au/

[1] International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013.

9. Additional support for students

- The Current Students Gateway: https://student.unsw.edu.au/
- Academic Skills and Support: https://student.unsw.edu.au/academic-skills
- Student Wellbeing, Health and Safety: https://student.unsw.edu.au/wellbeing
- Disability Support Services: https://student.unsw.edu.au/disability-services
- UNSW IT Service Centre: https://www.it.unsw.edu.au/students/index.html
- Assessment Implementation Procedure: https://www.gs.unsw.edu.au/policy/documents/assessmentimplementationprocedure.pdf
- Special Consideration: https://student.unsw.edu.au/special-consideration