UNSW Course Outline

MATS6004 Materials Industry Management - 2024

Published on the 27 May 2024

General Course Information

Course Code : MATS6004
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Science
Academic Unit : School of Materials Science & Engineering
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course is designed for students interested in management skills within the materials industry who are completing an engineering program majoring in Materials Science and Engineering. It covers a range of topics including employability, workplace dynamics, project

planning, commercialisation, strategic business analysis and innovation, and professional ethics.

The purpose of this course is to provide students with a basic understanding of career development, innovation, as well as management principles, and how they may be applied within a materials industry context.

The course will be delivered through a combination of lectures, guest lectures and tutorials. The lectures and guest lectures will provide an overview of the course content with practical case studies, while the tutorials will give students the opportunity to apply the concepts they have learned, discuss the content and work on assessments.

The course will feature a range of guest lectures from industry representatives, providing insight into the commercial framework in which materials engineers operate. Students will have the opportunity to apply their knowledge through case studies and real-world scenarios and business proposals.

Course Aims

The aim of this course is 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. This course should equip students with key attributes including a more confident presentation style, an awareness of career goals and paths, and the skills required to promote and manage commercially viable, responsible innovation initiatives within their chosen career path, underpinned by core economic principles.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Describe key career development and professional issues for engineering graduates, analyse workplace management dynamics in a range of settings, and critically assess proposed solutions through the creation of a project management plan.
CLO2 : Apply economic, accounting, marketing, and strategic business analysis principles where appropriate to evaluate real engineering situations arising within a commercial context.
CLO3 : Apply in-depth project management skills to the development of a suitable business case for concept implementation and planning an appropriate and detailed project management plan for its implementation.
CLO4 : Write a risk management document that would appropriately complement a project management plan, and implementing principles of process resilience engineering.

Course Learning Outcomes	Assessment Item
CLO1 : Describe key career development and professional issues for engineering graduates, analyse workplace management dynamics in a range of settings, and critically assess proposed solutions through the creation of a project management plan.	• Project Management Plan • Management Research Topic
CLO2 : Apply economic, accounting, marketing, and strategic business analysis principles where appropriate to evaluate real engineering situations arising within a commercial context.	• Business case assignment • Risk Assessment • Project Management Plan
CLO3 : Apply in-depth project management skills to the development of a suitable business case for concept implementation and planning an appropriate and detailed project management plan for its implementation.	• Business case assignment • Risk Assessment
CLO4 : Write a risk management document that would appropriately complement a project management plan, and implementing principles of process resilience engineering.	• Risk Assessment

Learning and Teaching Technologies

Moodle - Learning Management System | Blackboard Collaborate | Echo 360

Learning and Teaching in this course

This course will be delivered through a series of lectures and in class assignment 'workshops', as well as special guest lectures on selected industry topics. Lectures will be delivered where possible in hybrid mode, but unless otherwise specified, in person attendance is expected.

Additional Course Information

This course partners with a similar course in management to deliver some lectures asynchronously. Some of the guest lectures throughout the term will therefore be pre-recorded and provided asynchronously online. In those weeks there will be at least one less lecture, with the expectation that students view the recorded lecture. You should regularly check the moodle course page to verify whether lectures are going ahead the following week.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Business case assignment Assessment Format: Group	45%	
Project Management Plan Assessment Format: Group	20%	
Risk Assessment Assessment Format: Individual	20%	
Management Research Topic Assessment Format: Individual	15%	

Assessment Details

Business case assignment

Assessment Overview

Part 1 (20%): Your group must submit a proposal prior to developing a complete business case. This assessment is intended to provide you with experience and skills in developing business cases for innovative proposals and understanding commercial imperatives, and assesses content covered in guest lectures on business case development and economics.
Approx 2000 words.
Group feedback will be provided two weeks after the submission date (week 7)
Please note: the first 10% is awarded as a group mark, the additional 10% is awarded as an individual mark based on your peer feedback and individual lean canvas.
Indicative submission timeline:
Assessment Launch: Week 2
Proposal due: Week 3
Business Case Part 1 Due: Week 5

Part 2 (25%): In this assessment, your group will provide a more complete and detailed business case and deliver a business pitch; a presentation of your case. This may either be submitted as a video or delivered live in person (subject to circumstances during term). Inspiration for your work will be drawn from additional lecture content on business case analysis and project management.
Approx. 2000 words
Indicative submission timeline:

Launch: Week 8

Due: Week 10

In person business pitches may have a different due date to the above business case report.

Group feedback will be provided 1-2 weeks after the submission date (week 11-12)

Please note that although you will present in groups, your marks will be allocated individually based on your individual presentations within the group presentation, and your supporting material.

Course Learning Outcomes

- CLO2 : Apply economic, accounting, marketing, and strategic business analysis principles where appropriate to evaluate real engineering situations arising within a commercial context.
- CLO3 : Apply in-depth project management skills to the development of a suitable business case for concept implementation and planning an appropriate and detailed project management plan for its implementation.

Detailed Assessment Description

Part 1 (20%):

Your group must submit an entrepreneurial proposal prior to developing a complete business case. This assessment is intended to provide you with experience and skills in developing business cases for innovative proposals and understanding commercial imperatives, and assesses content covered in guest lectures on business case development and economics.

Approx 2000 words.

Group feedback will be provided two weeks after the submission date.

Please note: the first 10% is awarded as a group mark, the additional 10% is awarded as an individual mark based on your peer feedback and individual lean canvas.

Indicative submission timeline:

Assessment Launch: Week 2

Proposal due: Week 3

Business Case Part 1 Due: Week 5

Part 2 (25%):

In this assessment, your group will provide a more complete and detailed business case and deliver this as a business pitch; a presentation of your case. This may either be submitted as a video or delivered live in person (subject to circumstances during term). Inspiration for your work will be drawn from additional lecture content on business case analysis and project management.

Approx. 5 mins

Indicative submission timeline:

Launch: Week 9

Due: Week 11

Group feedback will be provided 1-2 weeks after the submission date (week 11-12)

Please note that although you will present in groups, your marks will be allocated individually based on your individual presentations within the group presentation, and your supporting material.

Assignment submission Turnitin type

This is not a Turnitin assignment

Project Management Plan

Assessment Overview

For the business scenario/problem in the Business Case Assignment Part 1 (Assessment 2), you will develop a detailed project management plan for its implementation, being guided by the series of lectures on project management theory and practice. This assignment is intended to reinforce the theory presented in lectures on project management and practical implementation.
Approx. 2000 words.
The assessment will be due in week 8.

Group feedback will be provided to you within two weeks of the assessment being submitted (before week 10)

Course Learning Outcomes

- CLO1 : Describe key career development and professional issues for engineering graduates, analyse workplace management dynamics in a range of settings, and critically assess proposed solutions through the creation of a project management plan.

- CLO2 : Apply economic, accounting, marketing, and strategic business analysis principles where appropriate to evaluate real engineering situations arising within a commercial context.

Detailed Assessment Description

For the business scenario/problem in the Business Case Assignment Part 1 (Assessment 2), you will develop a detailed project management plan for its implementation, being guided by the series of lectures on project management theory and practice. This assignment is intended to reinforce the theory presented in lectures on project management and practical implementation.
Approx. 2000 words.
The assessment will be due in week 8.

Group feedback will be provided to you within two weeks of the assessment being submitted (before week 10).

Assessment Length

2000

Assignment submission Turnitin type

This is not a Turnitin assignment

Risk Assessment

Assessment Overview

For the business scenario/problem in Business Case Part 1, you will be required to identify the various risks to your proposal and PMP (Project Management Plan) and their underlying factors, 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. This will be submitted as a report.
This assessment is intended to ensure students develop confidence in proactive risk assessment and mitigation in an innovation context, building on lecture content devoted to risk management principles and protocol.
Approx. 1500 words
Timeline:
Launch: Week 7
Submission: Week 9
Individual feedback will be given to students within two weeks of the assessment being performed.

Course Learning Outcomes

- CLO2 : Apply economic, accounting, marketing, and strategic business analysis principles where appropriate to evaluate real engineering situations arising within a commercial context.
- CLO3 : Apply in-depth project management skills to the development of a suitable business case for concept implementation and planning an appropriate and detailed project management plan for its implementation.
- CLO4 : Write a risk management document that would appropriately complement a project management plan, and implementing principles of process resilience engineering.

Detailed Assessment Description

For the business scenario/problem in Business Case Part 1, you will be required to individually identify the various risks to your proposal and PMP (Project Management Plan) and their underlying factors, 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. This will be submitted as a report.
This assessment is intended to ensure students develop confidence in proactive risk assessment and mitigation in an innovation context, building on lecture content devoted to risk management principles and protocol.

Approx. 1500 words

Timeline:
Launch: Week 5
Submission: Week 8
Individual feedback will be given to students within two weeks of the assessment being performed.

Assessment Length

1500

Assignment submission Turnitin type

This is not a Turnitin assignment

Management Research Topic

Assessment Overview

You are to research a selected management topic (from a list of topics provided by course

coordinator) and to prepare a detailed research report outlining the management theory underlying the topic and to evaluate current practices employed by management.
Examples of topics include analysing the influence of wellbeing and morale on workplace dynamics, and avoiding workplace conflict.

You will be given feedback on the content and quality of your presentation within two weeks of submission.

This assessment is intended to provide you with an appreciation of workplace dynamics and how management of workplace culture influences performance.
Your submission should be structured as a research report designed to gather evidence and answer a specific question. The intended audience is an academic/social scientist audience with a specialisation in workplace dynamics and productivity.
Typically reports are required to be ~1500-2000 words in length.

Approximate Timelines (subject to variation):
- Report due Week 3
- The topics will be examined in online class discussions in Weeks 5, 7, and 9

Course Learning Outcomes

- CLO1 : Describe key career development and professional issues for engineering graduates, analyse workplace management dynamics in a range of settings, and critically assess proposed solutions through the creation of a project management plan.

Assessment Length

1500-2000

Assignment submission Turnitin type

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

General Assessment Information

A reminder that at all times you bear the responsibility of being aware of and complying with the university's student academic code of conduct, especially in relation to academic misconduct and plagiarism. If you directly refer to ideas or use text from external sources, they must be appropriately acknowledged. Please contact UNSW library services if you are unsure about how to do this.
If at any time a conflict is unable to be resolved in your groupwork, or you are unable to reach a group member, it is crucial that you contact Dr Pace as soon as possible, otherwise minimal help

can be provided.

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	Course Introduction and Objectives (BP) Engineering/Professional Competencies: Graduate + engineering competencies (BP) Career Development: Career development model; identification of skills, interests, values and goals; Development of personal brand statement. (KP) Group Formation: Identification of student roles and skillsets, announcement of groups for assignments. Attempting Personal Brand Statement draft in class (BP)
	Assessment	Assessment Task: Management Research Topic (15%) will be issued
Week 2 : 3 June - 9 June	Lecture	Innovation and Entrepreneurship Business Viability Principles and Practices; Lean Business Principles; Lean Canvas Development (MCIC+BP)
	Assessment	Business Case Pt 1 (Lean Canvas Assignment Launch) + Entrepreneurial Proposal
Week 3 : 10 June - 16 June	Lecture	Project Management Pt 1 (BP)
	Assessment	Entrepreneurial Proposal Due for feedback
Week 4 : 17 June - 23 June	Lecture	Project Management Pt 2 (BP)
	Assessment	Management Research Topic Due
Week 5 : 24 June - 30 June	Lecture	Risk Assessment + Sustainability in PM Case Studies (SM + DF)
	Assessment	Business Case Part 1 Due
	Assessment	Project Management Plan/Risk Assessment Assignment Launch
Week 7 : 8 July - 14 July	Lecture	Product Development Economics (SF) + Groupwork/Workshop
	Assessment	Risk Assessment Assignment Launch
Week 8 : 15 July - 21 July	Lecture	Professional career development and Networking (PG) + Technical Management & Graduate Attributes (BP)
	Assessment	Project Management Plan/Risk Assessment Assignment Due
Week 9 : 22 July - 28 July	Lecture	Intellectual Property & Commercialisation of business proposals (TBA)
	Assessment	Business Case Pt2 (Pitch) launch
Week 10 : 29 July - 4 August	Lecture	Research Careers (JD) & course wrap up Course Summary (BP)
Week 11 : 5 August - 11 August	Assessment	Business Case Pt2 (Pitch) Due

Attendance Requirements

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

Course Resources

Recommended 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

Course Evaluation and Development

The UNSW MyExperience survey will be used to collect student feedback in the course and make appropriate changes as recommended in subsequent terms

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Benjamin Pace		Rm 347, Hilmer Building E10		By Appointment	No	Yes
	Owen Standard					No	No

Other Useful Information

Academic Information

Upon your enrolment at UNSW, you share responsibility with us for maintaining a safe, harmonious and tolerant University environment.

You are required to:

- Comply with the University's conditions of enrolment.
- Act responsibly, ethically, safely and with integrity.
- Observe standards of equity and respect in dealing with every member of the UNSW community.
- Engage in lawful behaviour.
- Use and care for University resources in a responsible and appropriate manner.
- Maintain the University's reputation and good standing.

For more information, visit the UNSW Student Code of Conduct Website.

Academic Honesty and Plagarism

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. 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, plagiarism and the use of AI in assessments can be located at:

- The Current Students site,
- The ELISE training site, and
- The Use of AI for assessments site.

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

Submission of Assessment Tasks

Penalty for Late Submissions

UNSW has a standard late submission penalty of:

- 5% per day,
- for all assessments where a penalty applies,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot

submit an assessment, and
- no permitted variation.

Any variations to the above will be explicitly stated in the Course Outline for a given course or assessment task.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile Tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has been assessed, you will be contacted via your student email address to be advised of the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: https://student.unsw.edu.au/special-consideration

Important note: UNSW 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 to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control that affect your ability to study, you do not sit an examination or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

Faculty-specific Information

Additional support for students

- The Current Students Gateway
- Student Support
- Academic Skills and Support
- Student Wellbeing, Health and Safety
- Equitable Learning Services
- UNSW IT Service Centre
- Science EDI Student Initiatives, Offerings and Guidelines