UNIVERSITY OF CANBERRA

Technology and Engineering Management

Unit code and version	9789.3
Unit offering option	218249
Study level	Level 3 - Undergraduate Advanced Unit
Credit points	3
Faculty	Faculty of Science and Technology
Discipline	Academic Program Area - Technology
Unit offering details	Semester 1, 2024 , ON-CAMPUS , UC - Canberra, Bruce

Unit convener name and contact details

Unit Convener

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Academic content

Unit description

Managing technology is a powerful tool companies use to compete in an increasingly challenging global economy. This unit introduces students to management principles required to develop technologies into products. As industry becomes increasingly 'project-focused', employers are seeking engineers who possess strong project management knowledge, skills and capabilities in line with sustainable principles and ethical standards. The unit weaves contemporary theory with successful practices for an understandable, integrated presentation that focuses on the concepts, tools, and techniques that are most effective for today. Engineering ethics, leadership, globalization, risk analysis and quality assurance aspects of project management and engineering practice are presented to successfully transition students from formal education to professional practice. This unit is co-taught with Technology and Engineering Management PG, 9784.

Learning outcomes

On successful completion of this unit, students will be able to:

1. Understand the dynamics of technological innovation, and formulate technology strategies;
2. Evaluate contemporary project management frameworks and apply them to 'real world projects';
3. Identify key project stakeholders and propose effective response strategies to manage stakeholder pressure in both local and global projects;
4. Choose and execute appropriate frameworks and theories to initiate, plan, execute, monitor and control projects;
5. Develop strategies to actively resolve conflict situations;
6. Understand how to align projects with organisational goals and recognise the strategic significance of quality assurance; and
7. Understand and meet ethical standards, legal responsibilities, and regulatory issues confronting managers.

Graduate attributes

1. UC graduates are professional
   - communicate effectively
   - display initiative and drive, and use their organisation skills to plan and manage their workload
   - employ up-to-date and relevant knowledge and skills
   - use creativity, critical thinking, analysis and research skills to solve theoretical and real-world problems
   - work collaboratively as part of a team, negotiate, and resolve conflict
2. UC graduates are global citizens
   - adopt an informed and balanced approach across professional and international boundaries
   - behave ethically and sustainably in their professional and personal lives
   - think globally about issues in their profession
3. UC graduates are lifelong learners
   - adapt to complexity, ambiguity and change by being flexible and keen to engage with new ideas
   - reflect on their own practice, updating and adapting their knowledge and skills for continual professional and academic development

The graduate attributes of this unit address communication, analysis and inquiry, problem solving, working independently and with others, professionalism, ethics and social responsibility.

Skills development

As students of the University of Canberra, you will develop your critical thinking skills, your ability to solve complex problems, your ability to work with others, your confidence to learn independently, your written communication skills, your spoken communication skills and a number of work-related knowledge and skills.

Prerequisites

Must have passed 11486 Systems Analysis and Modelling AND Must have passed 7722 OR 11519 Professional Practice in Engineering

Corequisites

None.

Accreditation

ACS Accreditation

This unit is part of courses accredited by the Australian Computer Society (ACS)

Skills Framework for the Information Age (SFIA) v8

This unit aligns with the following SFIA professional skills:

- Organisational Change Management CIPM
- Technology Service Managemnet ITMG
- Innovation INOV
- Business Intelligence BINT
- Business Situation Analysis BUSA
- Project Management PRMG
- Risk Management BURM

SFIA skills are defined by levels of responsibility, based on autonomy, influence, complexity, business skills, and knowledge. Although this unit may cover knowledge and skills at higher levels, it is expected that graduates of undergraduate degrees will be capable of operating at Level 2 overall.

Seoul Accord

The UC generic skills address most of the requirements of the Seoul Accord. The remaining skills

2. Knowledge for Solving Computing Problems

5. Modern tool usage

10. Life-long learning.

EA Accreditation

This unit is part of courses accredited by Engineers Australia (EA)

This unit assesses and exposes students to the following Professional Engineer Stage 1 Competencies:

1.1 Comprehensive, theory based understanding – Indicators Assessed: a

1.2 Conceptual understanding – Indicators Assessed: a

1.3 In-depth understanding – Indicators Assessed: a

1.4 Discernment – Indicators Assessed: b, Indicators Exposed: a

1.5. Knowledge- Indicators Assessed: a, b, c, d, e, f

1.6. Understanding -Indicators Assessed: a, b, c, d

2.1 Application of established engineering methods – Indicators Assessed: h, i

3.1. Ethical conduct and professional accountability - Indicators Assessed: a, b, c,

3.3 Creative, innovative and pro-active demeanour – Indicators Assessed: c

3.4 Professional use and management of information – Indicators Assessed: c

3.5 Orderly management of self, and professional conduct - Indicators Assessed: b

3.6 Effective team membership and team leadership – Indicators Assessed: : a, b; Indicators Exposed:c, d

Timetable of activities

Week	Topic	Remarks
1	Introduction; Contemporary T&E management; Historical lookback and context.	No Tutorial
2	Trends in T&E Management; Global variations; Industry variance	Tutorial
3	Methods for T&E innovation	Tutorial
4	Methods for T&E innovation	Tutorial
5	Methods for iterating, optimising, organising and guardrailing	Tutorial
6	Methods for optimising quality - Lean Six Sigma	Tutorial
7	Leadership and leading T&E	Tutorial
CLASS FREE WEEK ,First Assessment due Friday 11:59 pm		
9	Managing non -technical elements in T&E - people	Tutorial
10	Managing non -technical elements in T&E - customers and stakeholders	Tutorial
11	Legal, compliance and ethics in	Tutorial

	innovation	
12	Delivering value in the organisational context	Tutorial, Presentations to be done at the tutorial
13	Unit review and outlook	Tutorial, Presentations to be done at the tutorial
14		Group Term Assignment and Peer Evaluation Index to be submitted by Wednesday 11:59 PM

Note: Changes in the timetable may occur. Please check constantly announcements on Canvas and your UC email for updates.

Unit resources

Required texts

Recommended text book: Morse, Lucy C. and Babcock, Daniel L. (2013) Managing Engineering and Technology, 6th Edition. Prentice Hall.

Further reading materials will be provided during the semester.

Please consult the unit website for further information on texts/reading recommendations.

Materials and equipment

Library and web resources will be announced on the unit website.

Laptop computers are not mandatory for this unit, but students are highly encouraged to bring their own devices to enhance their learning experience during the tutorial classes.

Unit website

Each unit you are enrolled in has an online teaching site in the learning management system UCLearn. You access UCLearn through MyUC.

Social Media

Social media will be used as part of the teaching and learning of this unit, and relates to websites and applications that allow students and staff to create and share material, or interact via social networking activities. This can take many forms including text, images, audio, video, gestures (such as 'liking', 'favouriting', 'following') and other multimedia communications. Students and staff should be aware that social media creates an environment for limitless communication, collaboration, dialogue and information exchange but that there should be an awareness of the 'amplificatory' effect of popular content, which can portray both positive and negative outputs. Students should note that social media is not at the control of the University and, therefore, changes may be made to learning or assessment materials at late notice as a consequence of changes to content or access to the social media platform. Students are warned that there may be possible disturbing content that can be viewed when using social media, that is outside the control of the University. Students who are concerned with the use of social media for privacy or other issues are advised to speak with their unit convener as soon as possible.

For further information please refer to the section on Social Media in the .

Assessment

Assessment item details

Term Assignment

Due date

Wednesday 11:59 PM week 14

Weighting

40%

- 35% for Term Assignment. Individual mark will be obtained based on peer evaluation index (PEI) X Group mark obtained.
- 5% for valid peer evaluation

Additional information

Peer evaluation

Peer evaluation is an important component of group assessment. This is also part of the active learning philosophy followed in the course where you are taking part in the evaluation process. The objective is to ensure fairness which will reflect the participation and contribution of each student in the group project. As a project manager you must manage and evaluate the performances of your team members, which is critical to manage human resources efficiently. Group dynamics amongst the project members is a complex issue, which plays an important role in the project outcome. In a real-life situation, you'll have to work with project teams of diverse team members with different personalities.

Finally, the two aspects of learning outcome or assignment, i.e., Product (what is the answer) and the second one is Process (how you do it) are equally important. While the supervisor/assessor will mark the product/report, the process part will be largely reflected through your peer evaluation so that it can accurately reflect individual contributions. Peer evaluation will be administered using a well-designed questionnaire consisting of 10 items (each with a range of 1-10 scale). It is a confidential exam document which you should not share with others. The aggregated mean of peer evaluation of an individual member will be the determinant of individual marks for the project report.

Assessment details

The term assignment will be developed during the tutorial classes (weeks 2-12) based on tutorial activities and the questionnaire which will be finalised on week 13. The final questionnaire template will be available on Canvas on week 10. Marks distribution for each question will also be provided in the template. Additional effort (outside tutorial hours) may be required to complete the activities.

Marks will be based on the following:

- Presentation of facts
- Quality of argument
- Evidence/ examples (where applicable)
- Baseline standard and expectations will differ based on the level between the PG and UG
- Peer evaluation

Please consult the Canvas site for further information on this assessment item.

Addresses learning outcomes

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- 5. Develop strategies to actively resolve conflict situations;
- 6. Understand how to align projects with organisational goals and recognise the strategic significance of quality assurance; and
- 7. Understand and meet ethical standards, legal responsibilities, and regulatory issues confronting managers.

Related graduate attributes

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Quizzes (Continuous Assessment)

Due date

Weekly

Weighting

10%

Additional information

There will be 12 weekly quizzes, corresponding to the lectures of weeks 1-12.

Each quiz will be worth 1% of the final grade. The maximum grade for the 12 quizzes will be 10%, corresponding to the 10 best marks for the weekly quizzes.

Extensions will not be granted for quizzes unless arranged prior to the quiz due date and time.

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First Assessment

Due date

Friday 11:59 pm Week 8

Weighting

30%

Additional information

This assessment includes the material covered in weeks 1-7.

The assignment will be open in week 7 and due in week 8.

Please consult the unit website for further information on this assessment item.

Students will be asked verbally on their submissions.

If students are unable to provide satisfactory answers during verbal assessments of their submissions, we reserve the right to adjust their submission marks accordingly.

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Final Presentation + Presenation Peer Evaluation

Due date

Presentations will be done during tutorials in weeks 12-13.

The presentation slides need to be submitted by Tuesday week 12.

Every student is required to evaluate and mark the presentation of other teams in the tutorial and provide constructive feedback.

Weighting

20%

- 15% Presenattion
- 5% Peer Evaluation

Assessment details

Every group will be presenting during tutorials in weeks 12-13.

All team members should participate in the presentation.

Presentations will be assessed by the tutor and all other students in the tutorial class.

Addresses learning outcomes

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Submission of assessment items

Approval of extenuating circumstances for late submission of assignments will be dependent upon the production of supporting documentation and at the discretion of the unit convener.

No other forms of submission other than the indicated in each assessment item will be accepted. Submissions via email will be ignored. If a student chooses to submit his/her assignment via the Internet off the campus, it is the student's responsibility to guarantee the accessibility of the Internet. Not being able to access to the Internet at a location which is off campus is not an excuse for extension.

Extensions will not be granted for quizzes unless arranged prior to the quiz due date and time.

Students will be asked to confirm the following online declaration at the point of submission. I certify that:

1. The attached assignment is my own work and no part of this work has been written for me by any other person except where such collaboration has been authorised by the lecturer/s concerned;

2. Material drawn from other sources has been fully acknowledged as to author/creator, source and other bibliographic details according to unit-specific requirements for referencing; and

3. No part of this work has been submitted for assessment in any other unit in this or another Faculty except where authorised by the lecturer/s concerned.

Extensions

Students can apply for an extension to the submission due date for an assessment item due to extenuating, evidenced circumstances (specific

details are found in the Assessment Procedures). An extension must be applied for before the due date. Documentary evidence (e.g. medical certificate) will be expected for an extension to be granted, however this will not guarantee that the application will be successful. The Unit Convener or relevant Program Director/Course Convener will decide whether to grant an extension and the length of the extension.

An Assignment Extension form is available from the Student Forms page.

Late submissions

The following late submission period and penalty is applicable to any teaching period commencing after 1 April 2024.

To support the provision of timely feedback to students within the unit, late penalties will apply for summative assessments where late submission is permitted. Late submissions without an approved extension or reasonable adjustment will result in a penalty of a mark reduction of 10% of the maximum available marks for the assessment item per day (or part thereof) up to and including three calendar days. If a student submits more than three calendar days late without an approved extension or reasonable adjustment, the student will be allocated a mark of zero for that assessment, with no feedback provided.

Approval of extensions based on extenuating circumstances will be dependent upon the production of supporting documentation and at the discretion of the unit convener.

For teaching periods commencing prior to 1 April 2024, a late penalty of 5 % of the maximum available marks for the assessment item per day (or part thereof) was applied up to and including seven calendar days. An assignment submitted over 7 days late will not be accepted.

Special assessment requirements

Conditions to PASS the unit:

1. Students need to obtain at least 50% in the Overall Mark, calculated as described above;

AND

2.Students need to obtain at least 40% in the Term Assignment AND at least 50% in all the other assessment items.

Both Conditions need to be satisfied.

Once you have met the conditions for a Pass, higher grades will be awarded on the basis of the highest category shown below, in which your marks fit.

85 <= Final marks <= 100	Final grade = HD
75 <= Final marks < 85	Final grade = DI
65 <= Final marks < 75	Final grade = CR
50 <= Final marks < 65	Final grade = P
0 <= Final marks < 50	Final grade = FAIL (NX, NS, NC or NN)

The unit convener reserves the right to question students orally on any of their submitted work and adjust their marks accordingly.

Supplementary assessment

Refer to the Assessment Policy and Assessment Procedures

Academic integrity

Students have a responsibility to uphold University standards on ethical scholarship. Good scholarship involves building on the work of others and use of others' work must be acknowledged with proper attribution made. Cheating, plagiarism, and falsification of data are dishonest practices that contravene academic values. Refer to the University's Student Charter for more information.

To enhance understanding of academic integrity, all students are expected to complete the Academic Integrity Module (AIM) at least once during their course of study. You can access this module within UCLearn (Canvas) through the 'Academic Integrity and Avoiding Plagiarism' link in the Study Help site.

Use of Text-Matching Software

The University of Canberra uses text-matching software to help students and staff reduce plagiarism and improve understanding of academic integrity. The software matches submitted text in student assignments against material from various sources: the internet, published books and journals, and previously submitted student texts.

Student responsibility

Learner engagement

Notional Workload:

Lectures: 24h

Tutorials/Workshop: 12h

Reading: 36h

First Assignment: 15h

Term Assigment: 48h

Presentation: 15h

Total: 150h

Inclusion and engagement

It is strongly recommended that students who need assistance in undertaking the unit because of disability or an ongoing health condition register with the Inclusion and Engagement Office as soon as possible so that reasonable adjustment arrangements can be made.

Participation requirements

Tutorial attendance is compulsary.

Your participation in both class and online activities will enhance your understanding of the unit content and therefore the quality of your assessment responses. Lack of participation may result in your inability to satisfactorily pass assessment items.

Withdrawal

If you are planning to withdraw please discuss with your Unit Convener. UC College students must also seek advice from the College.

Required IT skills

IT skills commensurate with advanced study of information technology are assumed.

Work integrated learning

Not applicable to this unit.

Student feedback

All students enrolled in this unit will have opportunities to provide anonymous feedback on the unit through the InterFace Student Experience Questionnaire (ISEQ). The request for your feedback will be posted on your InterFace page at least twice during a teaching period. InterFace can be accessed through MyUC.

Changes to unit based on student feedback

The content and material prepared for this unit has been reviewed in the light of feedback from previous student surveys/evaluation. In this year, more clarity will be brought in quiz questions, avoiding ambiguity between multiple choice questions. Peer evaluation process is clearly explained in the outline. Case studies used in the tutorials will be modified or changed with contemporary and more relevant case studies.This unit has been recently reviewed and revamped by a group of experts.

Authority of this unit outline

This unit outline must be read in conjunction with the University of Canberra's Policies and Procedures, including the Assessment Policy and associated Procedure. The Assessment Policy and Assessment Procedure include information on matters such as plagiarism, grade descriptors, moderation, feedback, and deferred exams.

Any change to the information contained in the Academic content and Assessment sections of this document, will only be made by the Unit Convener if the written agreement of the Program Director and a majority of students has been obtained; and if written advice of the change is then provided on the teaching site in UCLearn. If this is not possible, written advice of the change must be then forwarded to each student enrolled in the unit at their registered term address. Any individual student who believes themselves to be disadvantaged by a change is encouraged to discuss the matter with the Unit Convener.

Authority Text

Main

Exception – Potential changes to a unit's learning activities and assessment items (Approved Academic Board 2020)

In the event of Australian Government and/or ACT Government directive, such as those requiring physical distancing and restrictions on movement because of a pandemic, learning activities and/or assessment items in some units may change. These changes will not be updated in the published Unit Outline but will be communicated to students via the unit's UCLearn (Canvas) teaching site. The new learning activities and/or assessment items will continue to meet the unit's learning outcomes, as described in the Unit Outline.

New learning activities and/or assessment items will be available on the unit's UCLearn (Canvas) teaching site. Please contact the Unit Convener with any questions.