Mechanical and Manufacturing Engineering

Course Outline
Term 1 2020

GSOE9820

ENGINEERING PROJECT MANAGEMENT

Contents

1. Staff contact details

Contact details and consultation times for course convenor

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Consultation concerning this course is available in the first instance by class discussion in the MS Teams app. Course related discussion is best conducted in this context so that other class members have the benefit of seeing the answers (If this is insufficient, then please contact me for an appointment, indicating briefly why this is necessary).

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

Please contact people through the MS Teams app (click below for link):

GSOE9820 20T1 -
Engineering Project...

2. Important links

- Teams
- Moodle
- Lab Access
- Health and Safety
- 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 normal workload expectations of a student are approximately 25 hours per term for each UOC, including class contact hours, other learning activities, preparation and time spent on all assessable work.

Therefore, you should aim to spend about 10 h/w on this course outside class. The additional time should be spent in preparation for the lectures by reading the assigned preparation materials, making sure that you understand the lecture material, completing the set assignments, further reading, and revising for examinations.

Contact hours

	Day	**Time**	**Location**
Lectures	Thursday	6pm – 9pm	Ainsworth G03 (K-J17-G03)
Online discussion	Any	Any	MS Teams

Summary and Aims of the course

This course will introduce the fundamental principles of project management in an engineering context, enabling participants to become successful project managers.

This course takes an integrated approach to managing projects, exploring both technical and managerial challenges.

The course will provide you with a powerful set of tools to improve your ability to plan, implement and manage activities to accomplish specific organisational objectives.

The course will cover the terminology and core concepts and theories in Project Management to help you develop a range of skills, such as managing project teams, project schedules, budgets as well as being aware of strategic topics, different environments, cultures and ethics. The assessment tasks have been developed to build on the lecture topics using both theoretical and practical examples from industry to show how the theory is applied in practice and the details of when, where and how it should be applied.

The Project Management Standards (e.g. PMBOK) are also included in the course in order to comprehensively identify the critical knowledge areas that project managers must understand if they are aiming to take this industry qualification in the future.

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.	Know what a project is as well as understand the role and responsibilities of a project manager.	PE1.1, 1.3, 1.6, PE2.4, PE3.1
2.	Be able to create project plans, schedules and budgets.	PE1.1, 1.2, 1.3, 1.5 PE2.1, 2.2, 2.3, 2.4
3.	Be able to select and use the appropriate tools to aid in managing a project.	PE2.1, 2.2, 2.3, 2.4
4.	Be able to select and develop appropriate management styles to successfully complete a project.	PE3.1, 3.2, 3.3, 3.4, 3.5, 3.6

4. Teaching strategies

The course includes preliminary reading materials, traditional lectures and in-class activities. We use the pedagogical theory and practical recommendations of Team Based Learning (TBL). TBL is one type of flipped classroom strategy that has been shown to significantly improve student satisfaction and learning outcomes compared to traditional lecture delivery and take-home assignments. It has also been selected for this course, recognising the fundamental importance of teamwork to the discipline of project management.

Each module will follow the same approximate structure, as follows:

1. Prereading and other learning materials that you should complete before class;

2. Individual 'Readiness Assurance Test' (iRAT) in class at the start of each module;

3. Team 'Readiness Assurance Test' (tRAT) immediately following iRAT;

4. In class lecture(s); and

5. Application Exercises (AE) where students apply their knowledge in class as teams.

This pattern is repeated cyclically for each module during the course. The non-repeating, 'bookending' activities include:

6. Introductory lecture with trial exercises

7. Peer review in teams to moderate team marks

8. Final exam

There are no graded take-home assignments, although certain AEs may span more than one class. If this is the case, teams will have the opportunity to work on them between

consecutive classes. All of activities 2, 3 and 5 take place in the scheduled classes and contribute towards final marks.

5. Course schedule

Week	Date	Module	Demonstration	Indicative topics	Suggested reading
1	20 Feb	Introduction	Ainsworth G03 (K-J17-G03)	What is a project? Introducing the PM	Lock Ch. 1, 11 PMBOK: Ch. 1-3
2	27 Feb	Initiation	Ainsworth G03 (K-J17-G03)	Org. structures, culture	Lock Ch. 9, 21 PMBOK Ch. 2
3	5 Mar		Ainsworth G03 (K-J17-G03)	Strategy, project selection	Lock Ch. 6 PMBOK Sec. 4.1
4	12 Mar	Planning	Ainsworth G03 (K-J17-G03)	Defining the project, project scope	Lock Ch. 3, 12 PMBOK Ch. 5 (Sec. 1-4)
5	19 Mar		Ainsworth G03 (K-J17-G03)	Estimating costs and duration	Lock Ch. 4, 5 PMBOK Ch. 7 (Sec. 1-3) & Ch. 6 (Sec. 1-4)
6	26 Mar	Integration	Ainsworth G03 (K-J17-G03)	Scheduling	Lock Ch. 14, 15 PMBOK Ch. 6 (Sec. 5)
7	2 Apr		Ainsworth G03 (K-J17-G03)	Risk	Lock Ch. 7 PMBOK Ch. 11
8	9 Apr	Agile taster	Ainsworth G03 (K-J17-G03)	Introduction, lifecycle, implementing	APG* Ch. 1-5
9	16 Apr	Execution	Ainsworth G03 (K-J17-G03)	Progress, performance measurement	Lock Ch. 24, 25, 27 PMBOK Sec. 6.6, 7.4
10	23 Apr		Ainsworth G03 (K-J17-G03)	Closure	Lock Ch. 30 PMBOK Sec. 4.7

*Agile Practice Guide – see recommended reading.

Notes

Prereading for each week may be modified or updated with respect to the table above. Students need to stay up to date with notifications and changes on the MS Teams site.

6. Assessment

Assessment overview

	Assessment	Group Project? (# Students per group)	Length	Weight	Learning outcomes assessed	Assessment criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
1	Individual readiness assurance tests (iRAT)	No	15 mins / ea.	20%	All	Correct answers (multiple choice)	In class Wks 2, 4, 6, 8, 9	n/a	Immediately
2	Team readiness assurance tests (tRAT)	Yes (5-6)	15 mins / ea.	10%	All	Correct Answers (multiple choice)	In class Wks 2, 4, 6, 8, 9	n/a	Immediately
3	Application Exercises (AE)	Yes (5-6)	30-45 mins / ea.	30%	All	Correct Answers (multiple choice)	In class Wks 2, 3, 5, 7, 8, 9, 10	n/a	Immediately
4	Final Exam	No	2 hours	40%	All	All course content from weeks 1-10 inclusive.	During Examination Period	n/a	Upon release of final results

Assignments

There are no graded, written assignments (e.g. essays, reports, projects…) in this course.

Individual Assignments

Individual Readiness Assurance Tests (iRATs) take place in class at the start of each learning module are and graded individually. Feedback is provided in class.

Group Assignments

Team Readiness Assurance Tests (tRATs) and Application Exercises (AEs) are multiple choice tests that take place in class and are graded as teams. Feedback is instantaneous. Individual scores within the teams are moderated by a team peer review exercise in week 8. Team membership is assigned primarily randomly and with adjustments aimed at increasing the diversity of background and experience in each team. Changing teams is minimized wherever possible, although instructors may need to make team adjustments for certain reasons, such as in response to changing student numbers on the course. Team self-selection or modifying team membership to accommodate personal preferences is not allowed.

All group assignments include the possibility of student appeals. If a team believes that their answer to a particular question is better than the one provided, if they believe the question is ambiguously worded or if they believe the nominal answer is incorrect, the team is encouraged to submit a written appeal to the lecturer as soon as possible, citing evidence for this position. Successful appeals will cause the answer to be revised and awarding of the mark to each team who submitted a successful appeal. The deadline for submitting a written appeal is the end of the relevant module.

Presentation

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.

Submission

All assessments receive a mark of zero if not completed by the specified date, as indicated in the **Assessment overview** table.

Attendance

All in-class activities are strongly formative and participation in these provides the best opportunity to learn the material in the most effective way.

In theory it is possible for students to take iRAT tests (20% of grade) remotely, if they complete them concurrently with the class cohort when the test is open. To gain group

marks in the tRAT tests (10% of grade), all or part of the group must be present in the class to complete and hand in the physical scratch cards, which are used to submit the responses. Responses to AEs (30% of grade) need to be submitted by all or part of a group that is present in the class.

Overall, individual attendance is not monitored, and it is understood that students may miss some classes. However, individual absence or remote collaboration need be agreed above all with other team members, to avoid feelings of unequal workload among those who were present to win the marks on the team's behalf.

For approved special consideration applications, individual iRAT tests may be discounted from the calculation of grades. Group marks are not adjusted for special consideration.

Examinations

The 2-hour exam is 50% multiple choice questions and 50% long written answer. The multiple-choice questions are similar to taking a subset of the exam for the PMP professional qualification (see recommended reading for practice tests). The long answer requires an in-depth analysis of one advanced aspect of project management that has been taught during the course. There will be a choice of questions for the long answer, but only your one response with the highest grade will be counted.

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 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.

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 available 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

Lock (2007) provides a nice narrative explanation of the project management knowledge areas. The PMBOK guide provides similar information, although in a very process-oriented and technical style. These are the two main texts. For week 8, we use the Agile Practice Guide (APG) that is included in the cited edition of PMBOK.

Textbooks (All available as e-books in the UNSW library)

Lock, Dennis. Project Management. 9th ed. Aldershot, England ; Burlington, VT: Gower, 2007.

Project Management Institute, issuing body. A Guide to the Project Management Body of Knowledge (PMBOK Guide) : and, Agile Practice Guide. Sixth edition. Newtown Square, Pennsylvania: Project Management Institute, 2017.

Kerzner, Harold R. Project Management: Case Studies. 4th ed. Somerset: Wiley, 2013.

Levin, PMP, PgMP, Dr. Ginger. PMP® Exam Preparation : Test Questions, Practice Test, and Simulated Exam. First edition. Boca Raton, FL: Auerbach Publications, 2018.

Burke, Rory, and Steve Barron. Project Management Leadership : Building Creative Teams. Second edition. Chichester, West Sussex, United Kingdom: Wiley, 2014.

Cavanagh, Michael, Mr., and Professor Darren. Dalcher. Second Order Project Management. Farnham: Ashgate Publishing Ltd, 2012.

Recommended Internet sites

There are many websites giving lectures, papers and data on project management in general. See, for example:

Projectmanagement.com (associated with PMI):
https://www.projectmanagement.com/Webinars/webinarMainOnDemand.cfm

Linkedin Learning (all UNSW students have access):
https://www.myit.unsw.edu.au/services/staff/educational-technology/linkedin-learning

Other Resources

Plus many other valuable print books are in the library…

UNSW Library website: https://www.library.unsw.edu.au/
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, 2020 improvements resulting from student feedback, both positive and negative, include:
- Implementation of full Team Based Learning teaching strategy with popular pre-lecture quizzes and class exercises carried over into new RAT/ AE format.
- Moving course web pages to MS Teams to facilitate discussion; specific demonstrator roles to respond to online community.
- Cancelling the long, written assignment; transition of critical components into AEs and augmentation with more challenging and more industry-relevant problems.
- Adding written answers to the exam to test advanced understanding.
- Changing recommended reading resources to avoid students having to buy expensive textbook and using e-books from the UNSW library instead.

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
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Equitable Learning Services

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