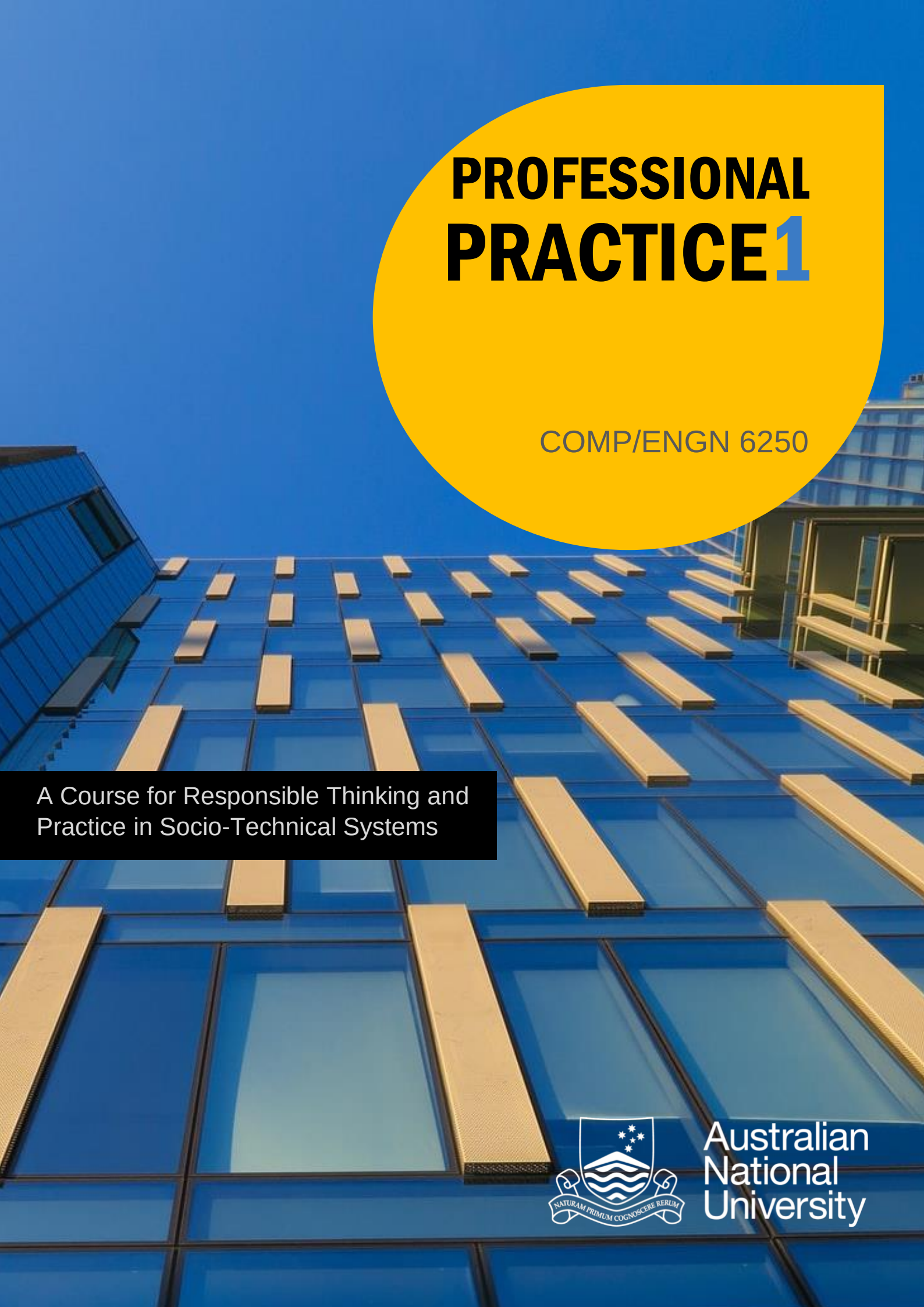

PROFESSIONAL PRACTICE 1

COMP/ENGN 6250

A Course for Responsible Thinking and Practice in Socio-Technical Systems

Australian National University

Professional Practice

The ability to integrate systems thinking, critical thinking, and effective engagement into a unified responsible way of thinking is an important skill for engineers who are shaping our world in 21st century. The world that is increasingly connected, global, and driven by digital technology and data, yet confronted with tough ethical and sustainability challenges. Industry 4.0 as the backbone of this new era, heralds the profound transformation in engineering practice.

The series of Professional Practice courses equip students with skill sets in the area of responsible thinking and practice, given the fact that government and industries across the world are moving fast towards adopting the Industry 4.0 platform.

PROFESSIONAL PRACTICE 1

This is the first in a series of two courses for engineering and computing graduate students that focus on developing professional and communication skills for the 21st century workplace. Industry bodies and employers of engineering and computing graduates consistently rank communication skills as one of the most important selection criteria when hiring.
This course aims to heighten students' awareness of professional practice, and to develop new interpersonal and communication skills, leading to students becoming more competent professionals in their field. Based on Engineers Australia and Australian Computer Society professional competencies, students will develop and practice fundamental skills required by industry to better equip them for the workforce.

Learning Outcomes

Upon successful completion, students will have the knowledge and skills to:

1. Communicate effectively in written and spoken English to transfer complex knowledge and ideas to technical and non-technical audiences.
2. Identify and use appropriate sources of information when developing professional documents.
3. Maintain and develop appropriate, effective and professional forms of documentation.
4. Demonstrate effective team membership skills and contribute collaboratively within diverse team environments.
5. Articulate and reflect on the industry expectations of competence and conduct in engineering and computing professions.

COURSE CONVENOR

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CODE **ENGN6250** UNIT VALUE **6 units**

OFFERED BY
RS Electrical, Energy and Materials Engineering

ANU COLLEGE
ANU College of Engineering and Computer Science

CLASSIFICATION
Transitional

COURSE SUBJECT
Engineering

AREAS OF INTEREST
Computer Science, Engineering, Communications, Computer Systems, Computer Engineering

ACADEMIC CAREER
PGRD

MODE OF DELIVERY
In Person

OFFERED IN
First Semester 2020
Second Semester 2020
See Future Offerings

Semester 2, 2022

10 hours per week (typically 3.5 hours of contact, of which 2 hours of tutorial activities, and 6.5 hours of non-contact study) for 12 weeks.

To enrol in this course you must be studying Master of Engineering or Master of Machine Learning and Computer Vision, and Graduate Diploma of Computing, Master of Computing and Master of Computing (Advanced).

Students will need to be familiar with the resources on the reading lists from this course each week before attending the lecture and tutorial.

Course Overview

01 Course Description

02 Course Format

03 Assessment Summary

04 Course Feedback

01 Course Description

Professional Practice 1 is the first of two foundation courses in computer science and engineering at ANU, providing students with deep knowledge about the challenges and processes involved in the professional practice. This includes, developing a systemic view over the socio-technical systems, considering ethical challenges in research and practice, writing and presenting effectively, and building effective teams in the challenging situations. By the completion of this course, students will be well placed to undertake a more nuanced understanding of responsible thinking and practice (Figure1). Topics covered in the course will help students prepare for the next course, Professional Practice 2.

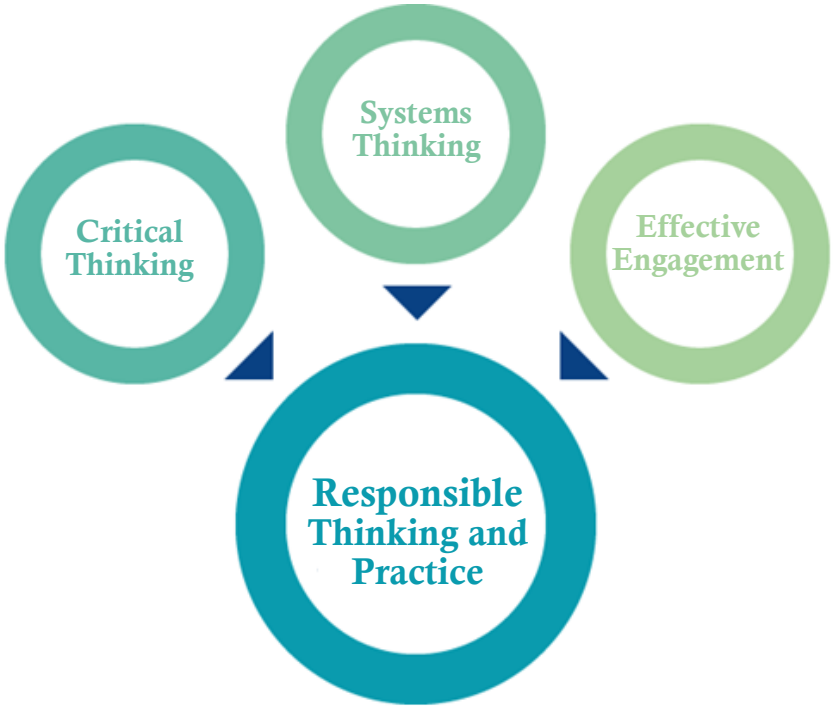

Figure 1 *Responsible Thinking and Practice: The diagram shows the conceptual model based on which Professional Practice 1& 2 are developed.*

Using cases from industry, academia, government and other civil society organisations, students will gain experience in developing the skills required for responsible thinking and practice. Each week students will focus on specific aspects of their practice as an engineer and computing professional. Students will learn to describe holistically the functioning of social, ethical, and environmental components of technical systems which they design and build. By the end of the semester, students will utilise (and develop) the toolkit provided for conducting a responsible practice. The toolkit will be completed and tested in Professional Practice 2.

The structure of the semester is presented in the table below.

Week	Theme
Week 1	Reading week (No lecture)
Week 2	Introduction to Professional Practice 1
Week 3	Writing effectively
Week 4	Being a systems thinker
Week 5	Mapping the ecosystem
Week 6	Being ethical in research
Week 7	Being responsible in innovation
Week 8	Toolkit
Week 9	Presenting effectively
Week 10	Being an effective team member/leader
Week 11	Having a deep conversation
Week 12	Marketing yourself effectively

02 Course format and session objectives

The average student workload is 130 hours for a 6 Unit course. This includes time spent in scheduled classes and self-directed study time.
(see https://policies.anu.edu.au/ppl/document/ANUP_000691)

The course workload for Professional Practice 1 is equivalent to 10 hours per week:

a) 1.5 hours of lecture
b) 2 hours of tutorial
c) 5-7 hours of independent student research, reading and writing

Coursework will involve individual work and case-study groupwork. Students are expected to attend all scheduled sessions.

Lecture and tutorial sessions

The Professional Practice 1 course is delivered in flipped mode, which means students will need to complete the readings, videos, activities, exercises each week before attending the lecture and tutorial.

To prepare for lectures and tutorials, students need to go through the relevant week's preparation material. In some weeks, students will be able to check their understanding of the weekly content by attempting the quiz questions.

During the tutorial session, students will then have an opportunity to practice these skills and competencies together with their peers and tutors. This will also provide them with an immediate opportunity for feedback through active learning, thus solidifying their Professional Practice skills and competencies.

If students have any questions about the course or the self-directed tasks they need to post their question on the course forum on the Wattle.

Students are also required to spend 5-7 hours of independent research, reading and writing during the week, preparing themselves for the lectures and tutorials.

03 Assessment Summary

Assessment for this course centres on key competencies important to think and practice responsibly as an engineer or computing professional, and relating to the targeted learning outcomes. Students will complete a semester-long project in groups, to practice the course material through hands-on case studies, and develop an actionable strategy grounded in real-life experience. Students will also be assessed weekly on their individual career episode piece, which centers around practicing course materials on one of their own career episode.

Assessment task	Value	Due date	Date for return of assessment	Learning outcomes
Career Episode Piece	**40%** 4 Submissions (10% for each week's submission)	• Piece1 – 18 March • Piece2 – 23 April • Piece3 – 20 May • Piece4 – 3 June	Within 2 weeks of submission	1,3,5
Case Study-Group Project	**50%** • Report (20%) • Group Presentation (10%) • Toolkit Portfolio (20%)	• Report - 27 May • Group presentation - week 11 • Toolkit Portfolio – 3 June	As results from first semester published	1,2,4,5
Tutorial Contribution	**10%**			1,2,3,4,5

- **Career Episode Piece (CEP) (40%)**

In this assignment each student will work individually on a career episode of their own in order to test course content on a personal and very familiar project. It provide students with a way of evaluating their skills and competencies throughout the semester.

CEP assignments provide students with an opportunity to develop reflexivity about their own practices and learning, and to develop succinct essay and reflective writing capability. Such a skill is particularly important for job readiness, including in formulating effective job applications, and for writing Career Episodes in CDR (Competency Demonstration Report) as a part of Engineers Australia accreditation process. This will also be in line with Australian Computer Society core body of knowledge for ICT professionals (CBOK).

Students will submit four Career Episode Pieces throughout the semester, each worth 10% of their final grade.

- **Case Study Group Project (50%)**

  This assignment is designed to allow students to test some of skills on a particular case study project. Students will receive a group mark for this assignment upon demonstration of equal contribution to the group project.

  For this task, each group will submit (the percentage is worth of the final grade):

  1) a report (20%)
  2) a group presentation (10%) , and
  3) a toolkit portfolio (20%).

- **Tutorial Contribution (10%)**

  The tutorial mark is not based on your attendance, but on how well you contribute to the tutorials. In this course, tutorial contributes to course assessment, and counts as 10% of the whole course mark.
  Tutorial marks are allotted by tutors, so ask them in the first tutorial how those marks will be distributed. A mix of preparation (reading and answering set questions), amount of participation and insightfulness of comments and questions is a common basis for awarding participation marks. Dominating or disrupting the group work may be marked down.

04 Course Feedback (and more)

Staff feedback

Students will be given feedback in the following forms in this course:

- Verbal and written feedback on the:
  - Career Episode Piece.
  - Case Study Group Project.

This feedback will be provided during and after the lectures and the tutorial sessions.

- Verbal feedback to the whole class during discussions and debates in all sessions.
- Formal written feedback on the formal assessments (below) including the:
  - 4 Career Episode Pieces.
  - Case Study Group Project

Student feedback on teaching and learning

Course assessment is designed to continually improve the course, as well as to inform the design of the Professional Practice courses. Course convenor and tutors will carry out a course review session with students at the end of the semester, focusing on how to improve Professional Practice 1 and inform any adjustments to future teaching.

ANU is committed to the demonstration of educational excellence and regularly seeks feedback from students. One of the key formal ways students have to provide feedback is through Student Experience of Learning Support (SELS) surveys. The feedback given in these surveys is anonymous and provides the Colleges, University Education Committee and Academic Board with opportunities to recognise excellent teaching, and opportunities for improvement. For more information on student surveys at ANU and reports on the feedback provided on ANU courses, go to http://unistats.anu.edu.au/surveys/selt/students/ and http://unistats.anu.edu.au/surveys/selt/results/learning/

Policies

ANU has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards and implement them. You can find the University's education policies and an explanatory glossary at: http://policies.anu.edu.au/. Students are expected to have read the Academic Misconduct Rule before the commencement of their course. Other key policies include: Student Assessment (Coursework), Student Surveys and Evaluations.

Moderation of Assessment

The Deputy Dean (Education) monitors marks across all courses offered by the CECS. Marks that are allocated during semester for assessment in a course are to be considered provisional until formalised by the College Examiners' meeting at the end of each semester.

If appropriate, some moderation of marks might be applied prior to final results being released.

Required Resources

There is no single set text for this course, however there is a required set of readings. They are available online through the course Wattle site, mostly as links to pdfs at online journal archive sites. Students can download and read them electronically or print as they see fit.
There is an expectation that students' assignments will engage with the readings, both to establish that they have studied the scholarly literature and also to flesh out their arguments with challenging or complementary points. Assignments that are light on referencing or that miss out on obviously relevant material from the readings and class activities will be highly unlikely to get a good mark.

Referencing requirements

Students can use any recognised academic reference system of their choosing in Professional Practice courses, provided referencing is complete, comprehensive and correct.
(see https://www.anu.edu.au/students/academic-skills/academic-integrity/referencing)

Support for students

The University offers a number of support services for students. Information on these is available online from http://students.anu.edu.au/studentlife.

CONTACT US

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