ENGG200

Engineering Practice

S2 Day 2017

Dept of Engineering

Contents

General Information

Unit convenor and teaching staff
Convenor
Yves De Deene
yves.dedeene@mq.edu.au
Contact via 98509152
E6B 125
Appointment via Email

Co-Convenor
Nicholas Tse
nicholas.tse@mq.edu.au
Contact via 9850 9075
E6B 1.09
Weekly Thurs 3-5; or via Email appointment

Credit points
3

Prerequisites
ENGG100

Corequisites

Co-badged status

Unit description
This unit covers a range of engineering specialisations with a series of lectures, laboratory sessions, self-study, group work and activities. Students learn about the process of engineering, solving problems, design and product development. The unit also gives students an opportunity to develop and practise generic skills such as written and oral communication. An aim of this unit is to give students some exposure to the specialisations and streams from which they must choose for the remainder of their studies.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

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

Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.

Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.

Demonstrating the ability to apply ethical frameworks to given workplace situations.

Define sustainability and assess the role of the engineering discipline.

General Assessment Information

Student Responsibilities

Be familiar with University policy and College procedures and act in accordance with those policy and procedures.

It is the responsibility of the student to retain a copy of any work submitted. Students must produce these documents upon request. Copies should be retained until the end of the grade appeal period each term.

Student is to perform the required due diligent for their assessment grade and rectify as soon as possible upon finding any errors.

Notifications

Formal notification of assessment tasks, grading rubrics and due dates will be posted on iLearn. Although all reasonable measures to ensure the information is accurate, The University reserves the right to make changes without notice. Each student is responsible for checking iLearn for changes and updates. Feedbacks to students will be provided on an ongoing bases in the workshop and via the gradebook in iLearn.

Report and Assignment Tasks

Assignment Problems will be posted on iLearn at least two weeks before their submission date. Assignment solutions will be posted within a week after the submission date. Submissions will not be accepted once the solution is posted.

Assignment submissions and plagiarism policies

All assignments and reports must be submitted electronically through iLearn (in pdf format). Submissions will undergo automatic plagiarism checking. For more details on the policies of academic penalties relating to academic honesty, please refer to the policies and procedures section below.

Submissions are expected to be typed set in a logical layout and sequence. Markers WILL NOT grade poorly organized or illegible scans or drafts. The expected workload includes preparation of final copies and clear diagrams.

Late submissions

Late submissions will attract a penalty of 20/100 marks per day. Extenuating circumstances will be considered upon lodgement of a formal notice of disruption of studies.

Hurdle Requirement

The final examination is a hurdle requirement because it is the only reliable assessment of individual performance for this unit. A passing grade of 50% or more in the final examination is a condition of passing this unit. Students who make a serious attempt but fail to meet the hurdle requirement will be given one further opportunity to pass. A serious attempt is defined as achievement of a mark of 40% or greater.

Grading and passing requirement for unit

In order to pass this unit a student must obtain a mark of 50 or more for the unit AND pass the hurdle assessment, that is the Final Examination.

For further details about grading, please refer below in the policies and procedures section.

Final Examinations

Final examinations will typically take place at the end of the semester and it is a hurdle assessment. For further information, please refer to the Examination Timetable website on www.mq.edu.au

Assessment Tasks

Name	Weighting	Hurdle	Due
Ethics Case studies - Group	10%	No	Week 4
Core Engineering knowledge A	10%	No	Week 9
Core Engineering knowledge B	10%	No	Week 10
Core Engineering knowledge C	10%	No	Week 12

Name	Weighting	Hurdle	Due
Core Engineering knowledge D	10%	No	Week 13
Participation	15%	No	Session 1
Exam	35%	Yes	Exam Period

Ethics Case studies - Group

Due: **Week 4**
Weighting: **10%**

You will be given an engineering ethics case study which you will discuss in a team of 4-5 students. You will prepare a short powerpoint presentation (approx. 5 slides, 8 minutes talk - 2 minutes discussion) which you will present in the practical session (week 4). Marks will be given towards how well the ethics theories that will be discussed in lecture 2 are applied to the case study and towards the way it is presented (also discussed in lecture 1).

On successful completion you will be able to:

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.
- Demonstrating the ability to apply ethical frameworks to given workplace situations.

Core Engineering knowledge A

Due: **Week 9**
Weighting: **10%**

This exercise involves the solution of a basic mechanics and hydraulics engineering problem. Some advise can be asked to the tutors during the practical sessions of week 7 and 8.

On successful completion you will be able to:

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.
- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.

Core Engineering knowledge B

Due: **Week 10**

Weighting: **10%**

This exercise involves the solution of a basic hydraulics and thermodynamics engineering problem. Some advise can be asked to the tutors during the practical sessions of week 8 and 9.

On successful completion you will be able to:

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.
- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.

Core Engineering knowledge C

Due: **Week 12**
Weighting: **10%**

This exercise involves the solution of a basic engineering problem (electrical motors, aerodynamics or electromagnetic). Some advise can be asked to the tutors during the practical sessions of week 9 and 10.

On successful completion you will be able to:

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.
- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.

Core Engineering knowledge D

Due: **Week 13**
Weighting: **10%**

This exercise involves the solution of a basic engineering problem (rocket propulsion and electronics). Some advise can be asked to the tutors during the practical sessions of week 10 and 11.

On successful completion you will be able to:

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.
- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.

Participation

Due: **Session 1**

Weighting: **15%**

Tutors evaluate the participation during the practical sessions which includes MATLAB coding, weekly tutorials, in class presentations and contribution to discussions.

On successful completion you will be able to:

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.
- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.

Exam

Due: **Exam Period**
Weighting: **35%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

Written exam

On successful completion you will be able to:

- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.
- Demonstrating the ability to apply ethical frameworks to given workplace situations.
- Define sustainability and assess the role of the engineering discipline.

Delivery and Resources

A series of lectures and practical sessions are organized in this unit that are intended to provide the engineering student with a range of professional engineering skills that are generally not covered in regular technical courses. The lectures are phased with the practical sessions and assignments. The emphasis of the unit is on engineering problem solving.

Lectures are also intended to aid the students to orient themselves in the long tradition of the engineering discipline and to help apply mathematical and physics principles to solving real engineering problems. We also reflect on engineering in the context of a society as a whole in which aspects of environmental sustainable development and ethical decision making are emphasized.

During practical sessions, tutorials will be given on Matlab, report writing tools (Latex) and presentation software (Powerpoint). During practical sessions, students will have the opportunity to develop and practice problem solving skills through exercises and can ask advice to the tutors.

Students are advised on their performance in class and on iLearn and are encouraged to actively participate in all workshop activities.

Course material in the form of Powerpoint slides and online tutorials will be provided through the online iLearn Learning System at: https://iLearn.mq.edu.au/login/MQ

Also links to open source software and other useful tools will be made available through the online iLearn Learning System.

Recommended books for self-learning:

- Engineering Your Future: An Australasian Guide (Second Edition) by Dowling, Carew and HadGraft - ed. John Wiley & Sons Australia, Ltd.

Technology used and required

- Library and internet search engines
- Word processing package
- Free graphics design software and presentation software
- Simulation and analysis tools

Unit Schedule

	Lecture	Practical session	Assignment due date
1	Introduction + professional engineering	none	
2	Engineering Ethics Presentation and report writing	Introduction to Matlab: Vectors and matrices	
3	Mechanics (Prehistory to Middle Ages)	Introduction to Matlab: Graphs and programming	
4	Mechanics (Statics and Dynamics)	Ethics case studies / presentations A1	A1: Ethics Case studies
5	Hydraulics (Renaissance)	Matlab Problem Solving	
6	Thermodynamics (Renaissance to Industrial Revolution)	Matlab exercises Problem Solving	A2: Mechanics: Pyramids, water clocks, geometry
7	Heat Engines (Industrial Revolution)	Problem Solving	A3: Hydraulics, balloons, space diving

8	Electricity to quantum (Enlightenment)	Problem Solving	
9	Plastics to Superconductivity (The modern era)	Presentations A2 Problem Solving	A4: Thermodynamics and engines
10	Sustainable Engineering in the Anthropocene	Presentations A3 Problem Solving	
11	Sustainable Energy	Problem Solving	A5: Assignment: Electrical motors, transformers, Airplane, X-ray tube
12	Engineering research / guest lecture	Presentations A4	
13	Buffer	Presentations A5	

Learning and Teaching Activities

Lecture 1 - Introduction and scope

In this introductory lecture, we will set the scope of this unit. We will briefly discuss the role of the professional organization 'Engineers Australia' and set the scope for this unit that has an emphasis on problem solving, self-learning and self-development. We will also reflect on critical thinking and analytical thinking which are essential ingredients to problem solving and ethical decision making.

Lecture 2 - The engineering method and project management

In this lecture we will discuss the organizational aspects of engineering projects and provide some helpful tools.

Lecture 3 - Report writing

An essential activity of professional engineers is report writing. This varies from project plans to technical reports, tenders and common communication tools such as memos, emails and letters. The essential ingredients of these reports will be discussed.

Lecture 4 - Communication in Engineering

Communication in engineering takes various forms: consultation and instructions, conversation, team meetings and presentations. We will discuss the essential characteristics of each of them and provide some guidelines on how to organize a meeting or give an oral presentation.

Lecture 5 - Ethics in Engineering

Engineering most often involves several stakeholders and may have significant impact on society and the environment. It is therefore essential that engineers are equipped with moral frameworks

that can help in making the most ethical decision. After a brief overview of philosophical movements and thinkers in normative ethics, we will demonstrate the importance of ethical decision making in engineering and discuss some scenario's where ethical decisions are required. The philosophical frameworks may be a guide in addressing real world moral dilemmas encountered in the engineering profession.

Practical session (+ Assessment) - Ethics case studies

Different engineering ethics dilemma's (case studies) will be distributed to teams of 4 students in week 2. Each case study will be discussed in team and in the practical session of week 4, each team will give an oral (powerpoint) presentation (10 min.) on the case study. In the presentation, the case study will be discussed in the light of the moral philosophical frameworks (provided in lecture 2).

Practical sessions on Matlab

Different practical sessions will be held on the use of Matlab. Spread out over different practical sessions, tutorials will be given by the tutors from the basic ingredients of Matlab (vectors and matrices) to plotting graphs and writing Matlab scripts. After each tutorial, students will have the opportunity to practice on exercises provided by the tutors.

Engineering problem solving

Human evolution is characterized by invention and curiosity and has shaped the environment in which we live today. In this lecture, we will follow mankind from prehistory to modern times in its ascent to understand nature and to create and shape the environment within the context of its 'Zeitgeist'. This historical overview is a narrative in which different concrete engineering problems will be highlighted which will be the problem solving exercises in tutorials and against which students will be able to test their problem solving capability.

Lecture 6 - Sustainable engineering

The challenges for a sustainable future will be discussed and some practical approaches will be provided.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration

In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcome

- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.

Assessment tasks

- Core Engineering knowledge A
- Core Engineering knowledge B
- Core Engineering knowledge C
- Core Engineering knowledge D
- Participation
- Exam

Learning and teaching activities

- In this lecture we will discuss the organizational aspects of engineering projects and provide some helpful tools.

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.
- Demonstrating the ability to apply ethical frameworks to given workplace situations.
- Define sustainability and assess the role of the engineering discipline.

Assessment tasks

- Ethics Case studies - Group
- Core Engineering knowledge A
- Core Engineering knowledge B
- Core Engineering knowledge C
- Core Engineering knowledge D
- Participation
- Exam

Learning and teaching activities

- In this introductory lecture, we will set the scope of this unit. We will briefly discuss the role of the professional organization 'Engineers Australia' and set the scope for this unit that has an emphasis on problem solving, self-learning and self-development. We will also reflect on critical thinking and analytical thinking which are essential ingredients to problem solving and ethical decision making.
- In this lecture we will discuss the organizational aspects of engineering projects and provide some helpful tools.
- Engineering most often involves several stakeholders and may have significant impact on society and the environment. It is therefore essential that engineers are equipped with moral frameworks that can help in making the most ethical decision. After a brief overview of philosophical movements and thinkers in normative ethics, we will demonstrate the importance of ethical decision making in engineering and discuss some scenario's where ethical decisions are required. The philosophical frameworks may be a guide in addressing real world moral dilemmas encountered in the engineering profession.
- Different engineering ethics dilemma's (case studies) will be distributed to teams of 4 students in week 2. Each case study will be discussed in team and in the practical session of week 4, each team will give an oral (powerpoint) presentation (10 min.) on the case study. In the presentation, the case study will be discussed in the light of the moral philosophical frameworks (provided in lecture 2).
- Human evolution is characterized by invention and curiosity and has shaped the environment in which we live today. In this lecture, we will follow mankind from prehistory to modern times in its ascent to understand nature and to create and shape the environment within the context of its 'Zeitgeist'. This historical overview is a narrative in which different concrete engineering problems will be highlighted which will be the

problem solving exercises in tutorials and against which students will be able to test their problem solving capability.

- The challenges for a sustainable future will be discussed and some practical approaches will be provided.

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

- Demonstrating the ability to apply ethical frameworks to given workplace situations.
- Define sustainability and assess the role of the engineering discipline.

Assessment tasks

- Ethics Case studies - Group
- Exam

Learning and teaching activities

- In this introductory lecture, we will set the scope of this unit. We will briefly discuss the role of the professional organization 'Engineers Australia' and set the scope for this unit that has an emphasis on problem solving, self-learning and self-development. We will also reflect on critical thinking and analytical thinking which are essential ingredients to problem solving and ethical decision making.
- Human evolution is characterized by invention and curiosity and has shaped the environment in which we live today. In this lecture, we will follow mankind from prehistory to modern times in its ascent to understand nature and to create and shape the environment within the context of its 'Zeitgeist'. This historical overview is a narrative in which different concrete engineering problems will be highlighted which will be the problem solving exercises in tutorials and against which students will be able to test their problem solving capability.

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where

relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.
- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.
- Define sustainability and assess the role of the engineering discipline.

Assessment tasks

- Ethics Case studies - Group
- Core Engineering knowledge A
- Core Engineering knowledge B
- Core Engineering knowledge C
- Core Engineering knowledge D
- Participation
- Exam

Learning and teaching activities

- In this lecture we will discuss the organizational aspects of engineering projects and provide some helpful tools.
- Different practical sessions will be held on the use of Matlab. Spread out over different practical sessions, tutorials will be given by the tutors from the basic ingredients of Matlab (vectors and matrices) to plotting graphs and writing Matlab scripts. After each tutorial, students will have the opportunity to practice on exercises provided by the tutors.
- Human evolution is characterized by invention and curiosity and has shaped the environment in which we live today. In this lecture, we will follow mankind from prehistory to modern times in its ascent to understand nature and to create and shape the environment within the context of its 'Zeitgeist'. This historical overview is a narrative in which different concrete engineering problems will be highlighted which will be the problem solving exercises in tutorials and against which students will be able to test their problem solving capability.

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.
- Demonstrating the ability to apply ethical frameworks to given workplace situations.
- Define sustainability and assess the role of the engineering discipline.

Assessment tasks

- Ethics Case studies - Group
- Core Engineering knowledge A
- Core Engineering knowledge B
- Core Engineering knowledge C
- Core Engineering knowledge D
- Participation
- Exam

Learning and teaching activities

- In this introductory lecture, we will set the scope of this unit. We will briefly discuss the role of the professional organization 'Engineers Australia' and set the scope for this unit that has an emphasis on problem solving, self-learning and self-development. We will also reflect on critical thinking and analytical thinking which are essential ingredients to problem solving and ethical decision making.
- In this lecture we will discuss the organizational aspects of engineering projects and provide some helpful tools.
- Engineering most often involves several stakeholders and may have significant impact on society and the environment. It is therefore essential that engineers are equipped with moral frameworks that can help in making the most ethical decision. After a brief overview of philosophical movements and thinkers in normative ethics, we will demonstrate the importance of ethical decision making in engineering and discuss some scenario's where ethical decisions are required. The philosophical frameworks may be a

guide in addressing real world moral dilemmas encountered in the engineering profession.

- Different engineering ethics dilemma's (case studies) will be distributed to teams of 4 students in week 2. Each case study will be discussed in team and in the practical session of week 4, each team will give an oral (powerpoint) presentation (10 min.) on the case study. In the presentation, the case study will be discussed in the light of the moral philosophical frameworks (provided in lecture 2).
- Different practical sessions will be held on the use of Matlab. Spread out over different practical sessions, tutorials will be given by the tutors from the basic ingredients of Matlab (vectors and matrices) to plotting graphs and writing Matlab scripts. After each tutorial, students will have the opportunity to practice on exercises provided by the tutors.
- Human evolution is characterized by invention and curiosity and has shaped the environment in which we live today. In this lecture, we will follow mankind from prehistory to modern times in its ascent to understand nature and to create and shape the environment within the context of its 'Zeitgeist'. This historical overview is a narrative in which different concrete engineering problems will be highlighted which will be the problem solving exercises in tutorials and against which students will be able to test their problem solving capability.
- The challenges for a sustainable future will be discussed and some practical approaches will be provided.

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.
- Solving engineering problems in mechanics, hydrodynamics, thermodynamics and electronics by applying mathematics, physics and chemistry concepts.
- Demonstrating the ability to apply ethical frameworks to given workplace situations.

Assessment tasks

- Ethics Case studies - Group

- Core Engineering knowledge A
- Core Engineering knowledge B
- Core Engineering knowledge C
- Core Engineering knowledge D
- Participation
- Exam

Learning and teaching activities

- In this lecture we will discuss the organizational aspects of engineering projects and provide some helpful tools.
- Different practical sessions will be held on the use of Matlab. Spread out over different practical sessions, tutorials will be given by the tutors from the basic ingredients of Matlab (vectors and matrices) to plotting graphs and writing Matlab scripts. After each tutorial, students will have the opportunity to practice on exercises provided by the tutors.
- Human evolution is characterized by invention and curiosity and has shaped the environment in which we live today. In this lecture, we will follow mankind from prehistory to modern times in its ascent to understand nature and to create and shape the environment within the context of its 'Zeitgeist'. This historical overview is a narrative in which different concrete engineering problems will be highlighted which will be the problem solving exercises in tutorials and against which students will be able to test their problem solving capability.

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcome

- Demonstrating competency in written and oral communication of technical concepts and solutions in engineering.

Assessment tasks

- Ethics Case studies - Group
- Core Engineering knowledge A
- Core Engineering knowledge B

- Core Engineering knowledge C
- Core Engineering knowledge D
- Participation

Learning and teaching activities

- An essential activity of professional engineers is report writing. This varies from project plans to technical reports, tenders and common communication tools such as memos, emails and letters. The essential ingredients of these reports will be discussed.
- Communication in engineering takes various forms: consultation and instructions, conversation, team meetings and presentations. We will discuss the essential characteristics of each of them and provide some guidelines on how to organize a meeting or give an oral presentation.
- Different engineering ethics dilemma's (case studies) will be distributed to teams of 4 students in week 2. Each case study will be discussed in team and in the practical session of week 4, each team will give an oral (powerpoint) presentation (10 min.) on the case study. In the presentation, the case study will be discussed in the light of the moral philosophical frameworks (provided in lecture 2).

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- Demonstrating the ability to apply ethical frameworks to given workplace situations.
- Define sustainability and assess the role of the engineering discipline.

Assessment tasks

- Ethics Case studies - Group
- Exam

Learning and teaching activities

- In this introductory lecture, we will set the scope of this unit. We will briefly discuss the role of the professional organization 'Engineers Australia' and set the scope for this unit that has an emphasis on problem solving, self-learning and self-development. We will

also reflect on critical thinking and analytical thinking which are essential ingredients to problem solving and ethical decision making.

- Engineering most often involves several stakeholders and may have significant impact on society and the environment. It is therefore essential that engineers are equipped with moral frameworks that can help in making the most ethical decision. After a brief overview of philosophical movements and thinkers in normative ethics, we will demonstrate the importance of ethical decision making in engineering and discuss some scenario's where ethical decisions are required. The philosophical frameworks may be a guide in addressing real world moral dilemmas encountered in the engineering profession.
- Different engineering ethics dilemma's (case studies) will be distributed to teams of 4 students in week 2. Each case study will be discussed in team and in the practical session of week 4, each team will give an oral (powerpoint) presentation (10 min.) on the case study. In the presentation, the case study will be discussed in the light of the moral philosophical frameworks (provided in lecture 2).
- The challenges for a sustainable future will be discussed and some practical approaches will be provided.

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- Demonstrating the ability to apply ethical frameworks to given workplace situations.
- Define sustainability and assess the role of the engineering discipline.

Assessment tasks

- Ethics Case studies - Group
- Exam

Learning and teaching activities

- In this introductory lecture, we will set the scope of this unit. We will briefly discuss the role of the professional organization 'Engineers Australia' and set the scope for this unit that has an emphasis on problem solving, self-learning and self-development. We will also reflect on critical thinking and analytical thinking which are essential ingredients to

problem solving and ethical decision making.

- In this lecture we will discuss the organizational aspects of engineering projects and provide some helpful tools.
- Engineering most often involves several stakeholders and may have significant impact on society and the environment. It is therefore essential that engineers are equipped with moral frameworks that can help in making the most ethical decision. After a brief overview of philosophical movements and thinkers in normative ethics, we will demonstrate the importance of ethical decision making in engineering and discuss some scenario's where ethical decisions are required. The philosophical frameworks may be a guide in addressing real world moral dilemmas encountered in the engineering profession.
- Different engineering ethics dilemma's (case studies) will be distributed to teams of 4 students in week 2. Each case study will be discussed in team and in the practical session of week 4, each team will give an oral (powerpoint) presentation (10 min.) on the case study. In the presentation, the case study will be discussed in the light of the moral philosophical frameworks (provided in lecture 2).
- The challenges for a sustainable future will be discussed and some practical approaches will be provided.

Changes in Response to Student Feedback

- The emphasis in ENGG200 will now be more on engineering problem solving using engineering foundational skills (maths, physics and chemistry).
- A module on mathematical modeling and simulations has been removed as per recommendation from the previous offering of the course.
- Additional teaching staffs have been added to facilitate students' development during the workshop activities.
- The inclusion of participation marks to encourage students' attendance to the workshops.