



# ENGG460

## Engineering Principles and Practice

S1 Day 2014

*Dept of Engineering*

### Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>Assessment Tasks</u>	3
<u>Delivery and Resources</u>	5
<u>Unit Schedule</u>	6
<u>Policies and Procedures</u>	7
<u>Graduate Capabilities</u>	8
<u>Changes since First Published</u>	11

#### **Disclaimer**

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

## General Information

Unit convenor and teaching staff

Unit Convenor

Eryk Dutkiewicz

[eryk.dutkiewicz@mq.edu.au](mailto:eryk.dutkiewicz@mq.edu.au)

Contact via [eryk.dutkiewicz@mq.edu.au](mailto:eryk.dutkiewicz@mq.edu.au)

Instructor

Michael Heimlich

[michael.heimlich@mq.edu.au](mailto:michael.heimlich@mq.edu.au)

Contact via [michael.heimlich@mq.edu.au](mailto:michael.heimlich@mq.edu.au)

Credit points

3

Prerequisites

69cp including ENGG300(P) and ISYS360(P) and admission to BE or BEBA or BEBBA or BEBCom or BEBSc

Corequisites

Co-badged status

Unit description

This unit aims to develop communication and other skills relevant to practising engineers. It deals with engineering approaches to problem solving, highlighting the social context of engineering and considerations such as economics, ethics, environmental impacts, and sustainability. It also provides preparatory work for ENGG411.

## 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:

Ability to recognise, articulate, and incorporate social, economic and environmental influences and outcomes into engineering practice.

Acquisition of a consciousness of professional ethics and responsibility.

An understanding and practice of the engineer's role, process, and procedures in an industrial or academic setting.

An understanding of technical, management, and professional obligations and liabilities.

Ability to undertake a high-level design of a complex system

Ability to undertake background research and project planning

## Assessment Tasks

Name	Weighting	Due
<u>Assignment 1</u>	5%	23/03/2014
<u>Assignment 2</u>	30%	4/5/2014
<u>Assignment 3</u>	5%	1/6/2014
<u>Assignment 4</u>	15%	8/6/2014
<u>Presentation</u>	5%	Week 12/13
<u>Final Exam</u>	40%	University Examination Period

### Assignment 1

Due: **23/03/2014**

Weighting: **5%**

On successful completion you will be able to:

- Ability to recognise, articulate, and incorporate social, economic and environmental influences and outcomes into engineering practice.
- Acquisition of a consciousness of professional ethics and responsibility.
- Ability to undertake a high-level design of a complex system

### Assignment 2

Due: **4/5/2014**

Weighting: **30%**

On successful completion you will be able to:

- Ability to recognise, articulate, and incorporate social, economic and environmental influences and outcomes into engineering practice.
- Acquisition of a consciousness of professional ethics and responsibility.
- Ability to undertake a high-level design of a complex system
- Ability to undertake background research and project planning

## Assignment 3

Due: **1/6/2014**

Weighting: **5%**

On successful completion you will be able to:

- Ability to recognise, articulate, and incorporate social, economic and environmental influences and outcomes into engineering practice.
- Acquisition of a consciousness of professional ethics and responsibility.
- An understanding and practice of the engineer's role, process, and procedures in an industrial or academic setting.
- An understanding of technical, management, and professional obligations and liabilities.

## Assignment 4

Due: **8/6/2014**

Weighting: **15%**

On successful completion you will be able to:

- Ability to undertake background research and project planning

## Presentation

Due: **Week 12/13**

Weighting: **5%**

On successful completion you will be able to:

- Ability to undertake background research and project planning

## Final Exam

Due: **University Examination Period**

Weighting: **40%**

3-hour, closed book

On successful completion you will be able to:

- Ability to recognise, articulate, and incorporate social, economic and environmental influences and outcomes into engineering practice.
- Acquisition of a consciousness of professional ethics and responsibility.
- An understanding and practice of the engineer's role, process, and procedures in an industrial or academic setting.

- An understanding of technical, management, and professional obligations and liabilities.

## **Delivery and Resources**

### **What is required to complete the unit satisfactorily**

Pass mark in each assignment component AND a pass mark in the final examination.

### **Extension requests**

Must be supported by evidence of medical conditions or misadventure.

### **Supplementary examination**

Applications for a supplementary examination (based on medical reasons or misadventure) will only be considered if students have gained passes in pre-examination assessments.

### **Text book**

There is no set textbook for this unit.

### **Reference book(s)**

Books or other publications for reference will be recommended.

### **Notes**

Lecture/tutorial notes will be provided as required.

### **Required unit materials and/or recommended readings**

Recommended readings listed below are available in MQ Library Reserve Collection. Appropriate sections from these books where applicable have been referred to in the week-by-week breakdown on the next page.

[DS] Management for Engineers, Prentice Hall, 3<sup>rd</sup> edition, ed: Danny Samson, 2001

[RBSC] S. Robbins, R. Bergman, I. Stgg, M. Coulter, "Management 5", Pearson/Prentice-Hall, 2009.

[PMP] E. Paul, F. Miller, J. Paul, "*Scientific Innovation, Philosophy, and Public Policy*", Cambridge University Press, 1996.

[JW] J. Welch, "Jack. What I've Learned Leading a Great Company and Great People", Headline, 2001.

Other background reading material may be provided before or during lectures on a case-by-case basis.

In addition students are expected to seek out additional material from sources such as books, journals, trade and industry magazines, professional society publications, newspapers, broadcast media, Internet.

Students are expected to prepare for the class and actively participate in class

discussions.

## Unit Web Page

<https://ilearn.mq.edu.au>

The above webpage will be used for all electronic communications with students in this unit.

## Changes made to previous offering of the unit

None.

## Unit Schedule

Week	Topics	Resources	Assignments Due
Week 1	What is Engineering?	DS ch 1	
Week 2	Conducting Research Projects		
Week 3	Business Models and Plans		Medical Implant Technology Report RFP Response due.
Week 4	Intellectual Property and Industrial Relations and Employment Contracts	IP Australia website  Fair Work Act 2009, APESMA website	
Week 5	Engineers and Communications	DS ch 16	
Week 6	Professional Engineering Associations	Engineers Australia website	
Week 7	Project Management	DS ch 14	Medical Implant Technology Report due
Week 8	Engineering Innovation and Technology Transfer	DS ch 15	
Week 9	Engineering Social Responsibility		
Week 10	Ethics and Morality	RBSC pp 186-198 PMP pp 47-62	
Week 11	Leadership	DS ch 6	Unit Portfolio Assignment due

Week 12	Thesis Preparation Assignment Presentations		Thesis Project Report due
Week 13	Thesis Preparation Assignment Presentations		

## 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](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

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

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

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/](https://students.mq.edu.au/support/student_conduct/)

## 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](http://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](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### 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

- Ability to recognise, articulate, and incorporate social, economic and environmental influences and outcomes into engineering practice.
- Acquisition of a consciousness of professional ethics and responsibility.
- An understanding of technical, management, and professional obligations and liabilities.

### 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 outcome

- Ability to undertake a high-level design of a complex system



## 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

- Ability to recognise, articulate, and incorporate social, economic and environmental influences and outcomes into engineering practice.
- An understanding and practice of the engineer's role, process, and procedures in an industrial or academic setting.
- An understanding of technical, management, and professional obligations and liabilities.
- Ability to undertake a high-level design of a complex system
- Ability to undertake background research and project planning

## 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

- An understanding and practice of the engineer's role, process, and procedures in an industrial or academic setting.
- Ability to undertake a high-level design of a complex system

## 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

- Ability to undertake a high-level design of a complex system
- Ability to undertake background research and project planning

## 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

- Ability to undertake a high-level design of a complex system

## 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 outcomes

- Ability to recognise, articulate, and incorporate social, economic and environmental influences and outcomes into engineering practice.
- An understanding and practice of the engineer's role, process, and procedures in an industrial or academic setting.
- Ability to undertake a high-level design of a complex system
- Ability to undertake background research and project planning

## 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

- Ability to recognise, articulate, and incorporate social, economic and environmental

influences and outcomes into engineering practice.

- Acquisition of a consciousness of professional ethics and responsibility.

## 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

- Ability to recognise, articulate, and incorporate social, economic and environmental influences and outcomes into engineering practice.
- Acquisition of a consciousness of professional ethics and responsibility.

## Changes since First Published

Date	Description
14/01/2014	The Prerequisites was updated.