



Professional Practice in Engineering Management

**ENGG 5204
6 Credit Points**

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Presented by: Professor Ron Johnston,
Don Scott-Kemmis, John Currie and Phil Rubie
Australian Centre for Innovation (ACIIC Ltd.)

&

Dr Michel Chaaya
Civil Engineering

Course material available on Faculty of Engineering website –

Learning Outcomes

	<i>Learning Outcomes</i> (Abilities to be developed and assessed in the unit)	<i>Related Grad Attribute Type</i> [Select one of seven ENG-IT Graduate Attribute types]
1.	Understanding of the principles and requirements of the professional engineer, in accord with the Engineers Australia graduate attributes, including social, economic and environmental aspects	Professional Practice
2.	Basic knowledge of the law of contracts and the obligations of professional and legal responsibility	Professional Practice
3.	Enhanced skills in all aspects of communication, including for technical and non-technical, and academic and public audiences	Communication
4.	Significant skills in searching for and evaluating information relevant to any particular topic, using the full range of information-searching tools	Information Skills
5.	Competence in working effectively as both leader and member of a team, including conflict resolution and in designing managing and completing a number of projects	Teamwork and project management
6.	Enhanced problem-solving and design skills learnt through direct instruction and application to tutorial problems and projects	Design and problem-solving skills

Learning Approach

Developing an understanding of the components and processes of professional development and practice is very different from learning engineering. There are no formulae to learn and apply; there is not even a set of right answers, though there are plenty of wrong ones. Hence a different learning approach is required. The essence of professional engineering practice is that you are dealing with people. Different people behave differently in the same, and different situations. The biggest challenge is rarely to work out what to do, but rather to communicate effectively to and motivate a group of people to work out what to do, and how to do it.

Hence it is crucial for you, the student, to arrive at your own understanding so that you can apply it in the varied situations you face in the future. In these circumstances, effective learning occurs with the learner's dynamic involvement. You cannot learn passively by simply listening to lectures - you must positively engage the material and experience of this course.

Through the conceptual material, your reading, and exercises, you will learn to cope with the practical business difficulties of imperfect and incomplete information, conflicting information, divergent personal views and internal organisational politics. It will require

you to actively engage in sorting, sifting, categorising, consolidating and transforming data.

The presentation and the project require the ability to work in teams with your fellow students, and to learn from one another's contributions. Hence it will be important for each student to develop the ability to effectively communicate their ideas, and listen to and respect the ideas of others.

Through exposure to a range of problems, you should start to be able to observe coherent patterns emerging. General principles will be drawn out to provide the basis for comparison and analysis in the real world. It will assist you in developing independent thought and responsible judgement.

Format

In general, the first hour of each class will be used to explore and explain the major issues associated with the topic. Class time is spent ensuring that you have understood this material and exploring new developments and extension to the basic concepts. The remaining hour of class time each week will be spent on exercises, project work and project presentations.

Reading

Textbook; Johnston, R., *Professional Engineering – A Reader*, McGraw Hill 2008

Other relevant books are:

Chang, C. M., *Engineering Management: Challenges in the New Millennium*, Pearson, 2005

Samson, D, (ed) *Management for Engineers*, Prentice Hall, 3rd edition, 2001

Bennett, F.I., *The Management of Engineering: Human, Quality, Organizational, Legal and Ethical Aspects of Professional Practice*, John Wiley, 1996

Beder, S., *The New Engineer: Management and Professional Responsibility in a Changing World*, Macmillan, 2000.

Johnston, S., Gostelow, P., and Jones, E., *Engineering and Society: an Australian Perspective*, Longman, 2nd edition, 1999

Assessment

Formal assessment for this course is designed to recognise both individual and team effort. This is an intentional effort to reflect the business environment where effective teamwork is essential to the achievement of individual success. Active participatory learning will be hallmark of success throughout the course.

<i>Description</i>	<i>Type of assessment</i>	<i>Teamwork involved? (Yes/No)</i>	<i>Weighting (%)</i>	<i>Week Due</i>	<i>Target Learning Outcomes</i>
Group presentation on a professional engineering practice issue	Presentation	Yes	20	4	1,4,5,6
Group project focusing on a specific case study solution + research	Assignment, case study	Yes	20	8	1,5,6
Application of legal study to engineering related real life case study (Group Project)	Assignment, case study	Yes	20	11	1,2
Group project on a major professional engineering practice issue	Project	Yes	40	13	1,2,3,4,5,6

All assignments should be handed to the lecturer at the end of the teaching period, or into the mailbox at the ACIIC office, Room 246, Link Building, by 4pm on the appropriate Friday.

Syllabus/Schedule

<i>Week</i>	<i>Topic(s)</i>
1	Introduction to Engineering Practice
2	Challenges for the Modern Engineer - the changing roles and employment of engineers in the 21st century; building your portfolio of professional engineering and management skills
3	Effective communication - critical skills of listening, speaking, presenting and writing; recognition and practice of the different skills required for different types and contexts of communication
4	Teamwork - challenges of effective teamwork; application of teamwork skills to problem solving in engineering; methods to reduce and resolve problems in team operation
5	Basic Fundamentals of Project Management
6	Project Management Processes, Structure, Strategy, People and Leadership
	Mid-Semester Break
7	Project Planning and Control, Statement of Work, Work Breakdown Structure, project scheduling techniques, costing, OHS and Risks
8	Introduction to key legal concepts and contract law basics
9	Introduction to other relevant laws (intellectual property, trade practices), advertising, consumer protection, legal processes, rights and remedies

10	Controlling liability by contract: measuring and managing risk, interpreting and drafting basic agreements
11	Professional and Legal Responsibilities of Engineers - the engineer has to be aware that their actions can impact on the general public, and that they have to allow for the use and mis-use of their designs or systems; the legal responsibilities of engineers; Australian liability laws; consumer rights and protection
12	Ethical Challenges for the Engineering Profession - the place of ethics in the practice of engineering; formal ethical responsibilities; engineering and moral complexity; from problem-solving to decision-making; the Engineers Australia code of ethics; introduction to a professional code of engineering performance
13	Summary of Professional Practice in Engineering Management