

## Subject Details

### #10 (4C) Chem Eng compulsory, Env Eng compulsory

1st Semester Pre: #68 Inc: E1263 or E1273

#### Coordinator:

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Consultation: Tuesday 2 - 4pm

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#### Tutors:

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Sarah Forrest 4<sup>th</sup> yr ChEng

## Subject Description

Engineers generally work as part of a team, with other engineers, scientists, and technologists. For a team to be successful, its members must be able to communicate effectively with each other. What's more, if you look in the papers, you will see that employers want graduates with excellent communication skills. So, engineers must be able to communicate with their professional colleagues. In addition, engineers are increasingly being asked to explain their decisions and designs to the community, which again requires good communication skills, as well as an awareness of the community's needs.

Communication can take many forms. In your professional life, the two most important (and obvious) are written and verbal presentations. You must also be able to listen well. This subject gives you the opportunity to learn about, and more importantly, to practise the written and verbal communication skills you will need to be successful in the engineering profession and to promote the engineering profession more broadly within our community.

This subject is compulsory for second years because it is a foundation subject. Without effective communication, the best engineering solutions will not be implemented effectively, and will not be accepted by the community. The skills learned in this subject will be used and further developed in many subjects later in the course.

## Subject Purpose

At the completion of this subject, you should be able to

- define and explain the 2 basic rules of communication
- demonstrate your understanding of these rules in your own written and verbal communication
- devise and confidently deliver clear written and oral proposals and reports
- identify and analyse problems in your communication and work toward solving these
- evaluate other people's written and oral communication skills

- analyse your audience and communicate appropriately
- adapt to working in teams of different people
- apply basic engineering methodology to define and solve problems

You should also have had some fun along the way with the design project!

## Teaching Methods

The best way to improve (communication) skills is to practise. This subject uses short lectures, exercises, tutorials, presentations, and invited guests to convince you that communication is important for engineers, and to give you the opportunity to improve your written and oral communication skills. Many two hour sessions begin with about 20 minutes of useful information transfer. The remainder of each session is spent on an exercise designed to illustrate the principles outlined in the lecture. In addition, problem based learning formats will be used in some sessions to encourage you to identify your own learning needs.

Local examples are used to maximise your involvement. Structured controversies and ethical situations will be used to encourage you to question and consider your professional ethics. Peer and self assessment will be used extensively to improve your evaluation and assessment skills. Group work will be used in some assignments and in class work to give you the opportunity to experience other points of view and approaches to learning. Reflective writing is used to help you discover how you learn by encouraging you to reflect on your learning and on your reactions to various experiences.

## My Approach to My Teaching and Your Learning

Very soon, you will be professional engineers. Being a professional engineer brings with it significant responsibilities, in terms of specific technical duties and more general responsibilities to society, and in terms of your conduct as a professional. In this subject, my aim is to treat you as a professional. In return, I expect you to act professionally.

An example of approach is that I have not specifically stated that attendance in all classes is compulsory. I believe that responsible students will either attend the classes I offer, or behave professionally, and explain to me, preferably in advance, why they are not able to attend.

I have endeavoured to structure this course to provide the best possible learning environment for you. I expect you to help me ensure that I achieve this goal, and I expect you to take advantage of the opportunities I try to provide.

Here is my test for whether or not I should be standing in front of you as a class, running a lecture / exercise / workshop: If it is something that you could be doing by yourself, then that is the way it should be. That means I strive to give my classes have a distinct purpose, and I try to run them so that you have useful experiences. I expect you to respond accordingly, by actively participating, and by critiquing my plans and actions to help me improve my teaching and your learning.

## Assessment

All assessment will be carried out during semester. There is no final exam.

### **Criteria referenced assessment**

This year, I am trialing criteria referenced assessment, in line with the new UQ policy on assessment. You can find out more about the reasons behind this and the current policies on UQ's www site: <http://uqadminserver.jdstorey.uq.edu.au/AcadBoardOffice/>

In previous years, we have graded against a normal distribution (the bell shaped curve approach). That presumes certain things about a group, and rates people against each other, rather than against some defined, independent criteria. It's like saying, 'we have only 100 driving licences to give out from the North Zillmere Transport Dept Office this week, so only the best 100 drivers will get a licence, regardless of our normal cutoff for proficiency in the driving tests. The University has now moved to criteria referenced assessment. Now, we are asked to define certain criteria, clearly and explicitly, and to mark against these. We can give out as many driving licences as we judge to be appropriate.

This is the first time I have formally used criteria referenced assessment. So, it is a trial for me and for you. I will be asking you to participate in deciding exactly what criteria are appropriate for a particular mark in a particular assignment. My aim in doing this is to involve you in the assessment scheme, to maximise your understanding and appreciation of the process, and to develop your own assessment skills.

### **Assessment types in E1267**

This year, I have categorised assessment as either

- (F) for feedback: formative, aimed at helping you formulate and develop particular skills and approaches, and receiving feedback from lecturer, tutors, peers
- (G) for grading: summative, aimed at assessing your competence and/or ability in a particular area / skill through some demonstration

In other words, only grading assessment contributes to your final grade for this subject. The breakdown of feedback and grading assessment is shown below:

Assessment type	Submitted work	In class work
for Grading (G)	<ul style="list-style-type: none"><li>• resume (15 hr)</li><li>• design project (30 hr) and presentation (10 hr)</li><li>• technical report (15 hr)</li><li>• some reflective writing (10 hr total)</li></ul>	
for Feedback (F)	<ul style="list-style-type: none"><li>• short presentation (10 - 15 hr)</li><li>• draft report for design project</li><li>• some reflective writing (10 hr total)</li></ul>	<ul style="list-style-type: none"><li>• 10 exercises (20 hr total)</li></ul>

**IN ORDER TO PASS THIS SUBJECT, YOU MUST ATTAIN A MINIMUM GRADE OF 3.0 (see section on Grading for explanation of this level) FOR ALL GRADING (G) ASSESSMENT**

(G) Assessment items which attain a grade of 1 or 2 can be resubmitted, but only once, and the maximum attainable grade for the resubmitted work is 3.

You will note that pieces of assessment are not accompanied by a percentage, but rather by an estimate of the time required to prepare a reasonable submission. This is explained more fully in the section entitled *Grading*.

This table gives details of the assessment timeline.

Assessment	Time Estimate	Grade Factor	Feedback (F) or Grading (G)	Handed out	Due
In class assessment (2 hours ea)	20 hr total	0	F	• 10 exercises in class	• in same class generally • see timetable for details
Short presentation	10-15 hr	0	F	• topics agreed on Wed 25 Feb	• given to class in wks 3 & 4
Resume	15 hr	1	G	• Wed 4 Mar	• Mon 23 Mar
Design Project & presentation	30 hr 10 hr	2	F = Eol + draft report G = final report + presentation	• Wed 25 Mar	• report: Wed 6 May • presentations: • Wed 13 May
Technical report	10-15 hr	1	G	• Mon 18 May	• Mon 1 Jun
Reflective Writing (2 hours ea)	10 hr	0.5	F = Reflections 1, 2, 3 G = Reflections 4, 5	• 5 exercises • handed in as two sets	• Reflections 1,2,3 Th 9 Apr • Reflections 4,5 Wed 3 Jun • see timetable for details
In class participation		0.5	G	• ongoing	• ongoing

Notes on Assessment (see section below on *Grading* also)

1. This is a 10# subject over 14 weeks with no exam. The times given above are a guide for the effort you should place on individual assessment items. Use this as a guide when you prepare your assignments. See the section on grading for an explanation of how different pieces of assessment contribute to your marks at the end of semester.
2. The Grade Factor is essentially a weighting factor for helping to calculate your final grade for this subject. It is explained in the section entitled *Grading*
3. The feedback assessment items do not contribute to your final grade. Obviously, the more exercises you do, the more you will gain from the subject.

### In class exercises

In class assessment is an important part of this subject. It is used to provide you with feedback from the opportunity to develop and practise your skills with specific types of communication linked where possible to local examples. In class assessment uses group work and individual efforts. Most in class exercises are self or peer assessed.

### Verbal presentations

You are asked to give two formal presentations: the first is short (5 minutes) and will be videotaped for analysis and feedback by tutors and peers. The first presentation does not contribute to the final grade in the subject. The second is a little longer (around 20 minutes), and will be given in a group as part of the design project. Presentation sessions will be peer assessed. You will also be expected to participate in class with brief informal presentations from time to time.

## Written assessment

The aim of the written assessment tasks is to maximise your opportunity to gain useful experience. You will be asked to respond to a job advertisement for vacation employment with a letter and your resume. Problem identification and problem solving are the skills which underpin most proposals. Proposals are an important part of doing business in the engineering profession, so groups of you will develop and submit a proposal concerning a design project. Technical reports are another very common form of engineering writing, so the final piece of written assessment is a technical report based on your own work in another subject.

## Reflective writing

Reflection is recognised as a crucial step in the learning process. The aim of introducing you to reflective writing is to help you develop this skill, and to encourage you to use it to reflect on what you are learning in the subject, how you are learning that, how you can apply it elsewhere, and how you can re-evaluate your own actions in the light of this new information.

The following table shows the topics for reflective writing (refer to timetable for more details).

Reflective Writing	Topic
#1	Engineering audiences and communication
#2	Preparing and delivering short presentations
#3	Creativity / Initial team work
#4	Final design stages / team work
#5	Engineering practice and responsibilities

## In class participation

Class work is an important component of this subject. At the end of the semester, you will negotiate and agree on your grade for class participation which incorporates, for example, completing and assessing (F) feedback exercises and presentations, group work, questioning in class and in presentations, working under directions (eg teams, pairs, individuals), discussion, critiques, etc. The expectations for this component of the assessment will be clearly developed in class.

## Grading

Grading is the process by which a final grade for a subject is assigned to individuals. You are probably used to a simple addition procedure for all items of assessment. That is just one of the many models suggested in the education literature. In this subject, we are going to trial one of the many variations of criteria referenced assessment.

Each piece of (G) assessment for grading will be marked against a set of particular criteria which are agreed on and distributed when the assignment is set. Marks for each piece of grading assessment will be awarded as a grade from 1 to 5 according to the table below. These definitions will be expanded and discussed in class by week 2.

Grade	Standard
1	unsatisfactory
2	poor / mixed
3	sound
4	good
5	excellent

The relationship between the grades achieved in the (G) assessment and your final grade in the subject is determined by the Grade Factors shown in the table giving assessment timeline details, earlier in the *Assessment* section, and the following relationship:

$$\text{final grade (1 - 5)} = \frac{\sum (\text{Grade Factor} \times (\text{G}) \text{ grade})}{\sum \text{Grade Factors}}$$

The cutoffs for translating from final grades on the 1 - 5 scale to the standard 1 - 7 scale will be given by week 2, once more information on weighted mark averages is available from the Faculty.

## Other Details

### *Policy Issues*

I advise you to keep photocopies of all submitted work. You should also keep computer backups, of course.

Assignments (excluding in class assessment) are due at 5pm on the nominated due date. Unless otherwise directed, assignments should be submitted, with a signed submission form, to the assignment box on Level 2 near the stairs. Penalties for late submission are shown below:

1 to 2 working days late	= lose 1 full grade
3 to 5 working days late	= lose 2 full grades
more than 5 working days late	= no grade will be awarded

If for some reason you need to negotiate an extension on a deadline, please come and see me BEFORE THE DUE DATE. I am generally flexible if you have a genuine difficulty. I am much less flexible if you approach me on the day on which the assignment is due, and even less flexible if you leave it until after the due date.

## Recommended texts and references

Paul V Anderson (1995) <i>Technical Writing: A Reader-Centered Approach</i> Third Edition Harcourt Brace & Company, Florida (bookshop; PSE library)	This book forms the background of the course, and has numerous practical examples of engineering communication. It is an excellent reference for those interested in continuing to improve their communication skills.
W Strunk Jr and E B White (1979) "The Elements of Style" Third Edition, MacMillan Publishing Co., Inc., NY (bookshop; approx \$14)	In my view, the best available concise reference and guide to clear writing. Again, an excellent, useful reference to add to your collection.
H Silyn Roberts (1996) <i>Writing for Science</i>	Heather is from the University of Auckland. She has been teaching written communication skills to engineers and scientists for many years. This is a factual, how-to type of text, with plenty of good advice sprinkled throughout.
D Samson (ed) (19??) <i>Management for Engineers</i> 2 <sup>nd</sup> Edition, Longman (bookshop; PSE library)	This is an Australian text. It is used in 3 <sup>rd</sup> and 4 <sup>th</sup> year management subjects in Chem Eng. The section on communication (Chapter 19) is written by engineering communication experts from Melbourne. It focuses on the psychology of communication, and effectiveness of communication. It does not provide 'how-to' guidelines in the same sense as Anderson, but it does provide very useful advice on troubleshooting written and verbal communication. A reasonable reference.
M Markel (1994) "Writing in the Technical Fields" (bookshop; PSE library)	This is a reasonably good, albeit dry, text on technical communications.
Institution of Chemical Engineers (1994) <i>Communication Skills for Engineers and Scientists</i>	Provided free of charge by the Institution of Chemical Engineers in Australia. A handy brief reference
G C Dandy and R F Warner (1989) <i>Planning and Design of Engineering Systems</i> Unwin Hyman Ltd, London	This is an introduction to engineering systems and design methodologies. It is the main reference for this part of the course. Another Australian text.
a decent dictionary	(eg Oxford, Macquarie)
a thesaurus	(eg Roget's)
a book on word usage	(eg Fowler's Dictionary of Modern English Usage)

**Timetable**

Class times: Monday 2 - 4pm in ???&amp; Wednesday 12 - 2pm in 43-102

Wk	Date	Activity	In Class (2 hr ea)	Self/Peer Assessed	Reflective Writing (2 hr ea)	Submitted Work Schedule
1	23 Feb	Communication & engineers				
	25 Feb	Remember your audience	✓	✓	#1	Wed 25 Feb: Short presentation set (10 hr)
2	2 Mar	Presentation hints				
	4 Mar	Resume writing (Careers)				Wed 4 March: Resume set (15 hr)
3	9 Mar	Short presentations		✓		Mon 9 March: presentations delivered (10 hr)
	11 Mar	Short presentations		✓		Wed 11 March: ditto
4	16 Mar	Short presentations		✓	#2	Mon 16 March: ditto
	18 Mar	Letters & memos	✓	✓		
5	23 Mar	Clear writing hints	✓	✓		Mon 23 Mar: Resume due (15 hr)
	25 Mar	Creativity and Design Methods				Wed 25 Mar: Design project set (30 + 10 hr)
6	30 Mar	Persuasive writing & Proposals	✓	✓		
	1 Apr	Group work on Eol				<i>Expression of Interest due ?</i>
7	6 Apr	Meetings, *** meetings	✓	✓	#3	
	8 Apr	Team work and listening	✓	✓	#3	Thurs 9 April Reflections 1, 2, 3 due (3 x 2 hr)
		<i>Semester Break</i>				
8	20 Apr	Data presentation	✓	✓		
	22 Apr	Abstracts, Intros and Summaries	✓	✓		<i>draft design report due ?</i>
9	27 Apr	Referencing	✓	✓		
	29 Apr	Group work				
10	4 May	<i>Labour Day</i>				
	6 May	Group work on reports			#4	Wed 6 May: Design report due (30 hr)
11	11 May	Group work on presentations				
	13 May	Proposal presentations		✓	#4	Wed 13 May: Design presentations delivered (10 hr)
12	18 May	Technical reports				Mon 18 May :Technical report set (15 hr)
	20 May	Group work				
13	25 May	Group work				
	27 May	Ethics and engineering	✓	✓	#5	
14	1 Jun	Engineering and diversity			#5	Mon 1 June: Technical report due (15 hr)
	3 Jun	Final review				Wed 3 June: Reflections 4, 5 due (2 x 2 hr)



**Tutor Timetable**

Class times: Monday 2 - 4pm in 68-308 &amp; Wednesday 12 - 2pm in 43-102

Wk	Date	Activity	In Class (2 hr ea)	Self/Peer Assessed	Tutor Attendance
1	23 Feb	Communication & engineers			all tutors initially, 1 to stay (3 hours)
	25 Feb	Remember your audience	✓	✓	1 tutor (2 hours)
2	2 Mar	Presentation hints			no
	4 Mar	Resume writing (Careers)			all tutors (6 hours)
3	9 Mar	Short presentations		✓	all tutors (6 hours)
	11 Mar	Short presentations		✓	all tutors (6 hours)
4	16 Mar	Short presentations		✓	all tutors (6 hours)
	18 Mar	Letters & memos	✓	✓	1 tutor (2 hours)
5	23 Mar	Clear writing hints	✓	✓	no
	25 Mar	Creativity and Design Methods			SF (2 hours)
6	30 Mar	Persuasive writing & Proposals	✓	✓	SF ? (2 hours)
	1 Apr	Group work on Eol			SF (1 hour) [CM away]
7	6 Apr	Meetings, *** meetings	✓	✓	SF ? (3 hours) [CM away]
	8 Apr	Team work and listening	✓	✓	SF (2 hours)
		<i>Semester Break</i>			
8	20 Apr	Data presentation	✓	✓	1 tutor (2 hours)
	22 Apr	Abstracts, Intros and Summaries	✓	✓	no ?
9	27 Apr	Referencing	✓	✓	no ?
	29 Apr	Group work			SF (1 hour)
10	4 May	<i>Labour Day</i>			
	6 May	Group work on reports			no
11	11 May	Group work on presentations			no
	13 May	Proposal presentations		✓	all tutors (6 hours)
12	18 May	Technical reports			no
	20 May	Group work			no
13	25 May	Group work			no
	27 May	Ethics and engineering	✓	✓	maybe
14	1 Jun	Engineering and diversity			FYI
	3 Jun	Final review			all tutors briefly

50 hr of tutor time in class (about 20%). Have available 3 tutors x 90 hr ea = 270 hr