UNSW
ELEC4122

Session 1, 2018

Strategic Leadership & Ethics — the Students' Guide

Course Staff

Course convener: Dr I. Skinner, `i.skinner@unsw.edu.au`
You will also have other class-room teachers.

Consultations: Students are encouraged to use the on-line discussion tools found on the course moodle-site.
Matters concerning course *content & administration* should be referred to the conveners.
Class-room teachers have responsibility for arrangements within their respective classes.
All questions about the *industrial training requirements* should be addressed to Dr Moors.

Course details

Units of Credit: ELEC4122 is a 6 UoC course; we emphasis that 6 UoC means 6 UoC: the *indicative student workload is 150 hr* (i.e. 12 hr/wk), spread over the session. Of course, the amount of work you actually choose to do depends upon your ambition and your ability.

Classes: ELEC4122 has 5 timetabled class hours, but you average only 4 hours / week. Lecture classes begin in Week 1 and run every week, though not always for 2 hrs. The 2-hr seminar classes meet 11 times, beginning in week 2. The 1-hr tutorial classes run from week 2 to week 7. The 2-hr activity class **only** occurs in Week 1. A full list of the classes is available on `myunsw`.
You *must attend the same seminar & tutorial classes* all session.

Course Information

Context and aims

This course is the final, formal step in the non-technical, professional part of your undergraduate education. It also includes the Industrial Training requirement, specified by Engineers Australia.

Aims: *This course is primarily designed to enhance your ability to (i) analyse ethical problems, determine a plan of action, and articulate this resolution to others, and (ii) make decisions about technological innovations and to, thereby, engage productively in the leadership of various groups.* In both cases we are primarily interested in the context of engineering, but the skills apply equally to your wider life.

A further expectation is to provide you with an understanding of the complex, interlocking organisations that form the wider, non-technical context in which engineers practice, and with some practical guidance both for interacting professionally with other engineers, wherever they might be, and for behaving when practising as engineers, especially within large organisations under strong commercial pressures. Ethical analyses will be specifically informed by the formal guidance provided by the Engineers Australia (2010).

Parallel Teaching: Some of the lecture classes will be shared with the postgraduate course GSOE9510 because there is an overlap of content. Such classes will be in the 4122 class-room.

Learning outcomes

After the successful completion of this course, the student will be able to

- describe the social, environmental, regulatory, & organisational context of engineering and identify which of its features are important for an engineering design;
- identify ethical problems, particularly in the context of engineering practice;
- formulate and communicate consistent, coherent responses to such problems, using the formal language of ethics and critically examine the ethical arguments proposed by others;
- correctly complete a go/no-go analysis;
- explain the challenges involved when experts make decisions;
- use different criteria, including aspects of sustainability, to evaluate technological innovations;
- help lead, i.e. facilitate the effective working of, a team (be it a technical project team or those involved in using an innovation); and
- identify ways to assess and reduce risks, especially those associated with human fallibility.

In summary, we expect you will improve your ability to consider problems from *multiple perspectives* and make decisions associated with *uncertain, inconsistent and imprecisely defined* requirements, as is often the case when *people are involved*.
Appendix 1 provides details of how this course contributes to teh program's graduate outcomes.

Additionally, students are expected to improve their skills in gathering and synthesising information, in the oral and written presentation of arguments, in listening, and in working with other people, some of whom will have ideas and beliefs very different from your own. It is clear

these objectives can be met only when students actually engage in arguing (both written and oral) about the best course of action to be followed, i.e. the best decision.

Teaching strategies

ELEC4122 consists of the following elements: “lectures”, student presentations, other classroom activities/workshops, onlne discussions, and self-paced learning.

Self-paced and reflective learning

This is not a conventional lecture course. Rather than having a set of traditional, weekly, ‘instructional’ lectures, *this course is structured as a reading course*. This means that you will only increase your knowledge of the core material by reading the prescribed resources, and not by attending lectures.

It is an important professional skill to be able to search through information and identify what you need; being able to discipline your own learning will stand you in good stead for the rest of your lives. It is also important to be able to reflect on what you have learned, for without doing so you cannot identify what you yet need to learn.

Of course, no “lecture notes” will be handed out, but you will receive suggested readings. Some students don’t believe this, and complain when it doesn’t happen.

Lectures

Formal ‘lectures’ introduce the main themes of the course, provide some motivation, and present the fundamental concepts you must understand.
In other plenary classes, we will have visitors who will discuss specific topics, set in a specific context.

Student-led seminars

The student-led seminars are an opportunity to practise your communication and teamwork skills. They also help develop your independent judgment as you must ethical problems and argue their resolution. This is true whether you are presenting or listening. You will be actively engaged in meeting the learning objectives while exploring questions identified by yourselves.

Tutorial activities

The other tutorial activities are to provide structured reflection on some of the ideas explored during the course. They will afford you the chance to share your understandings and experiences with each other, facuilitated by a tutor. Once again you will practise key skills. You cann only learn the material in this course by active engagement with other people.

Be assured that you will find this course more fun than you initially expect. Every year students are different but every year it is a pleasure to see them get passionate & care about something. Whatever else, make sure you *ENJOY YOURSELF*. We enjoy this course, too.

Assessment

There are several components for the summative assessment in this course.

Your exam mark x is determined from two items: your class-test and final exam mark. These have flexible weightings (to advantage you) as follows:

$$x = 50 \times \max(t/3 + 2f/3, t/5 + 4f/5),$$

where f and t are your final exam and class-test marks, respectively, normalised to be out of 1.

You also get an an in-session mark y out of 50. This consists of two parts: major assignment weighted at 15 and weekly class-based work weighted at 35. In turn, the class mark comes from 2 seminar team presentations (15), active participation (16), and a go/no-go exercise (4).

Your final, summative course mark m is given by

$$m = \begin{cases} x+y & \text{,if } x+y \geq 70\ ; \\ 2x & \text{,if x} \leq 20\ ; \\ 100\frac{x-0.4y}{x-y+30} & \text{,otherwise .} \end{cases}$$

If $x \leq 20$, your final mark consists entirely of x, so *you must get a satisfactory mark for the combination of final exam and the class-test marks in order to pass this course.* If $x > 20$, then your exam and in-session marks each contribute to your final mark, with the in-session proportion increasing as x increases until they are equal. You will find an illustration on moodle showing what this formula means for different combinations of x and y.

The due dates for all assessment tasks are given in Table 4 below.

Final Examination: The written examination at the end of session will be of 2 hr duration. It will test critical thinking and general understanding of the course material in a controlled setting. It will be an *open-book* exam.

Class-Test: This *closed-book* test of 1 hr duration will test basic knowledge of the core ideas and key terms of the course. It will take the form of short-answer questions.

Seminar Presentations: You will participate in the presentation of two seminars as part of a *team of FIVE students*. You can express preferences to help us organise the groups. To do this, *you must complete & submit* the Seminar Group Preference Form by Friday 9 March (Week 2). The allocation of topics & the groupings of four students per group will be announced in your classes in Week 3, and be available on moodle.

In these seminar presentations, the group is expected to explore the ethical implications of the topic. This necessarily involves *a clear statement of the questions* to be answered. There should

be perspectives from various ethical viewpoints that could be adopted to answer your questions. *Conclusions must be attempted.* Students are expected to research their topics. Students are expected to have enough content so that the presentation itself, i.e. excluding audience participation, would last about 50-60 minutes. The balance of the class will be discussion, questions, your activities, etc. Full details of this task's requirements are in a separate document.

Participation: You are required to participate during classes, *both tutorials and seminars.* This means *working on the activities, actively listening and appropriately contributing to discussions*, not simply being physically present. There will be no marks given for mere presence. If you do not do these things, you will not learn what we expect you to learn this session, notably how to respond when asked a question. Nor will you help others learn. You are also required to participate online, by providing feedback to your class-mates about their seminar presentations.

If you do not have a formal, acceptable explanation for missing a class, your participation mark will be reduced.

Major Assignment: Students are to complete a self-nominated activity that *demonstrates their successful meeting of the learning objectives.* This can be the work of an individual or a team; it can take any form: a traditional written report, an oral presentation, a piece of drama, a video, a song, etc. Note, though, that there is only a limited amount of time available for students to give oral presentations.

Your nominated task *must get prior approval* from us, who will consider (i) the scope of the task against it assessments weighting (15 %), (ii) how the proposal meets the nominated objectives, and (iii) the number of people involved. It *must be submitted by the agreed, prescribed date*, which, in all cases, should be on or before the end of Week 13. The sooner the proposal is in, the sooner it can be approved and you can start working on it. In any case, your proposal (i.e. your tender) must be submitted by Monday 9 April (Week 6).

Any student who does not nominate something else as a major assignment will be allocated the task of writing a formal report about a randomly assigned topic. Of course, as your proposal, you can nominate to write a formal report on a topic of your own choosing.

Formal Report: Students writing a formal report are required *to discuss the ethical and decision-making issues associated with the topic* given to them. Your report must consider both sides of any argument; it must clearly identify your conclusions on the issues and why you reached them. The report requires discussion of your topic using the formal frameworks for ethical reasoning, introduced in the course. It requires you to do some research. The main body of the report (including introduction & conclusion) should be $2500 \pm 10\%$ words. Full details of this task's requirements are in separate documents. *All formal reports are due Wednesday Week 11.*

Go/no-go Exercise: This climaxes with an activity in your tutorial class in Week 6. During the weeks before then, we will release some short reading materials on moodle. These will need you to write 150-200 words which you must bring to class in Week 6 when you will complete

the exerecise.
Full details of this task's requirements are in separate documents.

Industrial Training: Until you submit your report on industrial training, your mark for this course cannot be finalised. *If you have passed this course, but not completed your industrial training, then your grade will be set to PE.* The requirements for your industrial training and the associated report are available from the Faculty Office.

Note these general considerations about your assessment.
(i) All assessed tasks will be graded according to the academic merit (see nominated learning objectives) of the individual piece of work.
(ii) Marks will be moderated across all the activity & seminar classes to ensure equity. Any numbers given by your tutor only have meaning inside your class.
(iii) Being able to formulate and ask appropriate questions is an important skill and, where relevant, marks are influenced by the quality of the questions you raise.
(iv) Marks are also influenced by your ability to communicate your ideas clearly and concisely.

In all assessment tasks, you should read the instructions and pay attention to formal requirements detailed on any relevant cover-sheet. There is a standard penalty for late submission of a task: max possible mark = max(0.8^n, 0.5) 100 %, where n is the number of days late.

Course Schedule

The preliminary schedule for classes is shown in Tables 1-3. Please confirm the schedules for the 3 strands of classes on moodle, where it can be kept up-to-date.

The schedule for the plenary Wednesday classes is currently incomplete, as it depends on the availability of guests.

Table 1 Schedule for the lecture classes.
The sequence of classes depends on availability of guests,
but we will have a plenary class each week.

week		***learning focus***
1	Innovation in Context	technology's requirements & context, organisations
2	Ethics	ethical dilemmas in engineering; guidelines & motivations
tbc	Leadership	perspectives on leadership engineers in leadership
tbc	Risks	uncertainties, predictions, sustainability
tbc	guest lectures	
10	*class-test*	

Your seminar class meets 11 times. On each occasion, there will be discussion of ethical issues as they apply in (electrical) engineering practice. Your seminar class is strictly limited to a maximum of 20 students and presentations will be made by teams of 4 or 5 students.

Table 2 Seminar class schedule.
* There will be one class-specific week without a seminar.

week	***topic***	***led by***
2	Engineering Context	your tutor
3	Making Decisions	your tutor
4	Whistleblowing	your tutor
5 to 13*	student-led seminars	group of 3-4 students

Table 3 Schedule for Tutorial Activities.
Note that there is no related class scheduled after week 7.
This schedule is subject to change.

week	***learning focus***
2	evaluating technologies
3	leadership, not management
4	group decisions
5	strategic plans
6	go/no-go decisions
7	conflicting priorities

Assessment dates: The proposal for the Major Assignment is due Monday 9 April (Week 6). Any student who does not submit a proposal will be given a randomly assigned an assignment, as explained above.
Formal Reports must be submitted by Wednesday Week 11; self-nominated oral presentations will take place at the allocated time; other Major Assignments must be submitted by the end of the teaching session, i.e. Friday Week 13.
The Class-Test will be in the plenary class in Week 10 (Mon 7 May).

Table 4 Schedule of Critical Dates

week	*date*	*activity*
Week 2	Fri	*students:* deadline to nominate presentation teams
Week 3	Wed	*staff:* release seminar presentation topics
Week 6	Mon	*students:* deadline for proposals
Week 6	Fri	*staff:* final assignment approvals/random allocations
Week 10	Mon	*students:* class-test
Week 11	Wed	*students:* submit report (if you are doing a report)
Week 13	Fri	*students:* complete anything else not covered above
tba		exam

Resources for Students

On-line resources

There will be an active on-line site for this course.

Additional on-line resources relevant to these courses:
The Library: `info.library.unsw.edu.au/web/services/teaching.html`
The Learning Centre: `www.lc.unsw.edu.au`

There **is** a wealth of case studies related to engineering ethics on The Web. We encourage you to explore it, and think about what you find. Do you agree with it? Why? Likewise, on The Web, there is plenty of free advice about leadership and strategies. Be aware, though, that much of this is in the context of businesses.

Reference books

Martin & Schinzinger (1996) covers the essential material about ethics, and relates this to engineering practice. The aspects related to leadership are supported by Northouse (2007) and strategy & technological innovation are discussed in Schilling (2008),

neither of which is specific to engineering. A reference generally useful and also set in the context of (albeit civil) engineering is Beder (1998).

As mentioned above, "lecture notes" will not be distributed. However, you will get copies of selected readings associated with the various key topics. The crucial ones of these will be distributed on paper; others will be found on `moodle`.

Other books

There are many, better written and more entertaining books that pose significant, timeless ethical issues in works of fiction, and yet relevant to engineers, e.g. Asimov (1950), Clarke (1965), Shelley (1818), Stevenson (1886), and Orwell (1949). Likewise, engaging writers (not those of textbooks) have explored the nature of leadership, organisations, and strategy, from the legendary Homer (750 BC, 720 BC) and Lao-Tzu (6th century BC), through the Renaissance (e.g. Machiavelli 1532), to modern authors (e.g. Tolkien 1954). Consider the contrasting approaches to leadership shown in Shakespeare's *Richard II* and *Henry V*. Musings on such things are as old as human society itself.

DVDs

In your first 2 hr seminar class, you will watch a DVD telling the story of a celebrated "engineering achievement" (from *Constructing Australia* 2007, *Seven Wonders of the Industrial World* 2005). The Library has copies of all the sagas and we encourage you to view a couple more during the rest of the session, particularly with friends.

The Learning Centre

The Learning Centre is located in behind Student Central in the Chancellery. It provides free and confidential academic support services for students. These include assistance with communicating information in both written & oral forms. Given the nature of assessment tasks in this course, you may find this useful. You can approach the Centre directly for assistance on an individual (or group) basis, or you may choose to discuss your needs with Dr Skinner first.

Other Matters

Academic Honesty and Plagiarism

Plagiarism is the unacknowledged use of other people's work, including the copying of assignments written by other students or material found on The Web. Plagiarism is considered a serious offence by the University and severe penalties may apply. **Any plagiarism will be referred to the Head of School for further action.** For more information about plagiarism, please see Learning Centre (2010), or ask us.

Administrative Matters

On issues and procedures regarding such matters as special needs, equity and diversity, occupational heath and safety, enrolment, rights, and general expectations of students, please refer to the relevant School & UNSW policies.

Continual Course Improvement

We are eager to learn from this year's experience, and thereby to improve the learning outcomes of current and future students. Students are invited to provide feedback (positive or negative) to the course convener or a tutor, at any time. There is a discussion forum ("suggestion box") on moodle for this purpose.

Finally, *here is our best advice on how to succeed* in this course.

(i) Learn the key principles so that you can identify ethical issues and engage in ethical debates. Working through the textbook is an excellent way to start, but only a start.

(ii) Practise these skills in discussions, and not only in your designated tutorial times. Listen to others.

(iii) Complete all the assessment tasks at the appropriate time, to the required specifications.

(iv) Above all, **ensure you are enjoying yourself and finding points of interest**, for then the rest will follow. If you haven't found anything of interest in this course, then start asking questions, and please, please tell us.

Course References

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Appendix 1: Graduate Attributes

This course addresses the following Engineers Australia 'Personal and Professional Skills or Capabilities.'

- team skills and leadership ability
- an understanding of and commitment to the ethical, social, cultural, and environmental responsibilities of the professional engineer.

This course also addresses a number of UNSW 'Graduate Capabilities' (UNSW 2013b).

- *Scholars who are* understanding of their discipline in its interdisciplinary context; capable of independent and collaborative enquiry; rigorous in their analysis, critique, and reflection; ethical practitioners; and capable of effective communication.
- *Leaders who are* capable of initiating as well as embracing change and collaborative team workers.
- *Professionals who are* capable of operating within an agreed Code of Practice.
- *Global Citizens who are* capable of applying their discipline in local, national and international contexts; culturally aware and capable of respecting diversity and acting in socially just/responsible ways; and capable of environmental responsibility.