



# ELEC4122

## Strategic Leadership & Ethics

### COURSE INTRODUCTION — session 1, 2009

#### Course Staff

Course convener: Dr I. Skinner, room EE335, i.skinner@unsw.edu.au

You will also have a tutor.

**Consultations:** Students are encouraged to use the discussion tools on WebVista. As each tutorial group is autonomous, any questions related to tutorials should be directed to your tutor.

Matters concerning course *administration* should be referred to Dr Skinner.

All questions about the Industrial Training requirements should be addressed to Dr Epps.

#### Course details

**Units of Credit:** ELEC4122 is a 6 UoC course; we emphasize 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.

**Contact hours:** ELEC4122 has 5 timetabled hours. Currently timetabled classes are listed below. *All classes run in Week 1.*

|                       |           |         |           |
|-----------------------|-----------|---------|-----------|
| plenary class [2 hr]  | Monday    | 11–1 pm | CLB2      |
| seminar class [2 hr]  | Wednesday | 12-1 pm | QuadG048  |
|                       | Wednesday | 3-5 pm  | QuadG048  |
|                       | Thursday  | 2-5 pm  | QuadG041  |
| tutorial class [1 hr] | Tuesday   | 1 pm    | Webst 302 |
|                       |           | 3 pm    | Webst 302 |

This list of tutorial classes *was correct at the time of writing but is subject to change.*

You will have enrolled in a tutorial & a seminar class; you *must attend this same class* all session.

There will be a plenary class every week. The schedule is provided in the table below. Please note that, depending upon the availability of our guest speakers, *the schedule for these lectures may vary.*

There will be 11 of the 2-hr seminar classes; you get one week off. There will be 4 of the 1-hr tutorial classes. At the moment, these are scheduled activities in Weeks 2, 4, 6, & 8 but *this could be changed.*

# 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 IEAust.

**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 Institution of Engineers (IEAust, 2000).

## Relation to other courses

This course is part of the fourth year core of your BE program of study.

It is *not* a course about project management (studied elsewhere); nor is it a course about business strategies and intellectual property (studied in ELEC4445).

**Pre-requisites:** The pre-requisite for this course is successful completion of 120 UoC of study, or equivalent.

**Assumed knowledge:** n/a

**Following courses:** n/a

**Old courses:** Part of this course is equivalent to the course ELEC4011.

## Learning outcomes

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

- describe important aspects of the social, environmental, regulatory, & organisational context of engineering;
- identify ethical problems in an engineering context;
- formulate and communicate consistent, coherent responses to such problems, using formal frameworks about ethics;
- comprehend and critically examine ethical arguments proposed by others;

- explain details of an engineer’s rights and responsibilities;
- define technocratic decisions and some processes used to make them;
- use different criteria to evaluate technological innovations, including aspects of sustainability;
- 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 reduce risks, especially those associated with human limitations.

To help you understand better what is expected of you, Fig 1 illustrates the thought processes you are expected to demonstrate when considering ethics and Fig 2 illustrates how innovation, leadership and decision-making interact.

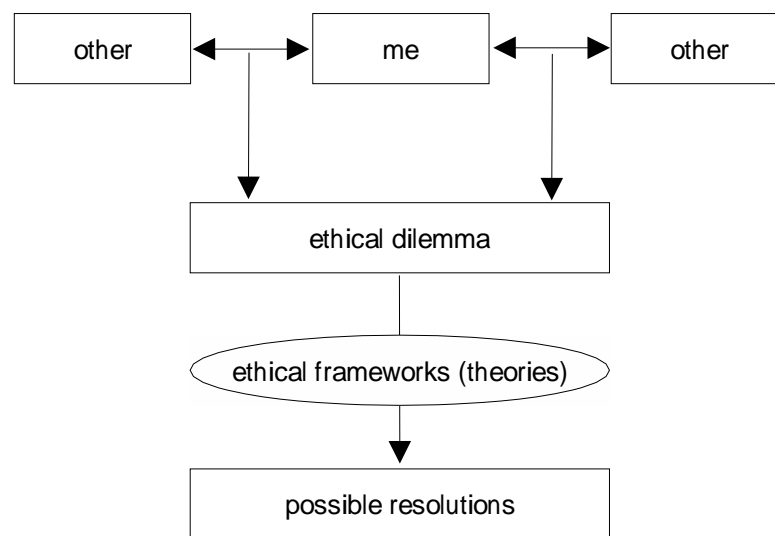


Figure 1: The connection of the key ideas in ethics

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.

This syllabus and learning activities address a number of *UNSW’s graduate attributes* (UNSW 2003).

#2 *An in-depth engagement with the relevant disciplinary knowledge in its interdisciplinary context.*

The formal syllabus explores engineering in its interdisciplinary context.

#3 *The capacity for analytical and critical thinking and for creative problem solving.*

The core learning outcome is that you can analyse poorly articulated problems and work your way to a ‘best’ resolution.

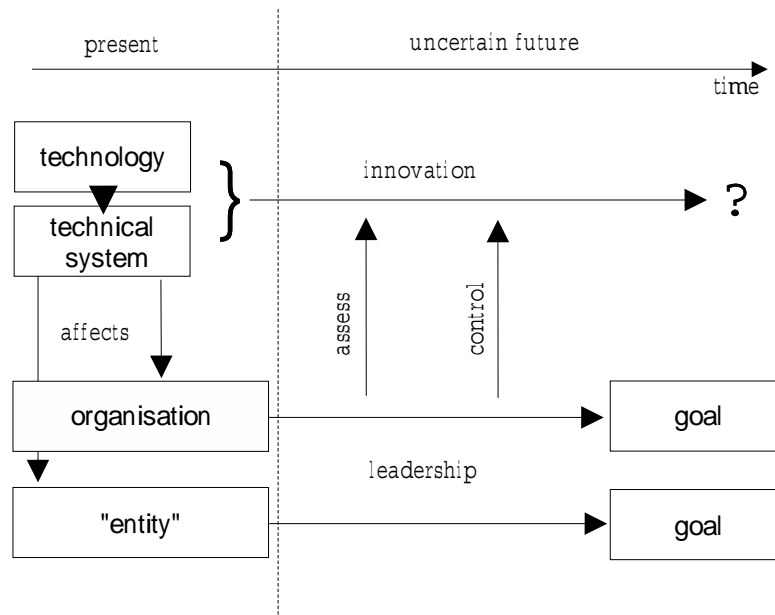


Figure 2: The connection of the key ideas about innovation and leadership

#4 *The ability to engage in independent and reflective learning.*

This is addressed by having you read materials instead of attending traditional lectures.

#5 *Information literacy – the skills to locate, evaluate and use relevant information.*

This is addressed as you evaluate and identify the information relevant to the problems you deal with in tutorial-based tasks, from its being a reading course, and by the nature of the major assignment.

#7 *An appreciation of, and respect for, diversity.*

This is part of your developing ethical awareness; you will learn about other people's perspectives.

#9 *The skills required for collaborative and multidisciplinary work.*

This is addressed by several group-based tasks and the formal syllabus.

#11 *A respect for ethical practice and social responsibility.*

That this is addressed is obvious!

#12 *The skills of effective communication.*

These are developed by the oral presentations and other in-session activities.

## Teaching strategies

ELEC4122 consists of the following elements: "lectures", student presentations, other tutorial-based activities, and self-paced learning.

## **Self-paced learning**

This is not a conventional lecture course. Rather than having a full set of traditional, weekly, 'instructional' lectures, this course is structured as a reading course. This means that you will only develop your understanding of the core material by reading the prescribed resources, and not at 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.

Of course, no lecture notes will be handed out, but you will receive suggested readings. A reading guide for the reference texts Martin & Schinzinger (2002) and Northouse (2007) can be found on the WebVista site. Additional relevant reading material will be given to you as we complete different, structured activities during the session.

## **Lectures**

Nevertheless, students are expected to attend the "lecture" classes.

Formal Lectures will occupy only weeks 1 to 5; these merely introduce the main themes of the course, provide some motivation, and present the fundamental concepts you must understand. Later in the session, we will have some visitors who will discuss specific topics, set in a specific context.

Also, you, the students, will present a series of mini-lectures based on nominated key readings.

## **Student-led seminars**

The student-led seminars are not only to foster your communication and teamwork skills; they require you to identify 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 the ideas explored during the course. They will afford you the chance to share your understandings and experiences with each other. Once again you will practise key skills. The syllabus of these courses is not such that you can learn without active engagement with other people.

Note that these 'teaching strategies' are supported and guided by *Guidelines on learning that inform teaching at UNSW* (UNSW 2006). In particular, these guidelines specify [p 6] "five broad categories: engaging students in learning; contextualising students' learning experience; creating an inclusive learning and teaching experience; designing an engaging, contextualised, and inclusive curriculum; and teaching an engaging, contextualised, and inclusive curriculum."

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 assessment in this course, as detailed in Table 1.

| <i>assessment task</i>           | <i>% weighting</i> |
|----------------------------------|--------------------|
| final exam*                      | 40                 |
| class-test*                      | 10                 |
| major assignment                 | 15                 |
| 2 seminar team presentations     | 15                 |
| mini-lecture presentation        | 5                  |
| 2-hr seminar class participation | 9                  |
| other in-session participation   | 6                  |
| TOTAL                            | 100                |

Table 1 Assessment weightings

Students must get a satisfactory mark from the subset of tasks indicated with \*.

Note that this assessment schedule *differs from that used in 2008* in several ways.

*Students must get a satisfactory mark for the final exam combined with the class-test to pass this course.*

If not, the grade UF will apply to what would be, otherwise, a passing mark.

All assessment tasks' "due dates" are given 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 of the course and will take the form of short answer questions.

**Seminar Presentations:** You will participate in the presentation of two seminars as part of a *group of 4 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 20 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 WebVista.

In these 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. Presentations are expected to last about 45 minutes. The balance of the class will be general discussion. Full details of this task's requirements are in a separate document.

**Seminar Class Participation:** You are required to participate in your respective tutorial classes. 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.

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

**Other Participation:** You are also required to participate in other classroom activities during the session. These occur in both the tutorial classes and the plenary classes.

**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, etc. Note, though, that there is only a limited amount of time available, if you wish to book a presentation.

Your nominated task *must get prior approval* from Dr Skinner, who will consider (i) the scope of the task against its assessments weighting (10 %), (ii) how the proposal meets the nominated objectives, and (iii) the number of people involved. It *must be submitted by the agreed, pre-scribed date*. In all cases this will be on or before the end of Week 12, in accord with UNSW's assessment policies. The proposal (your tender) must be submitted by Wednesday 8 April (Week 5), but we encourage you to get the negotiation started sooner.

Any student who does not nominate something else as a major assignment will be randomly allocated a topic and required to write a formal report on that topic.

**Formal Report:** Students completing 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 about 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  $3000 \pm 10\%$  words. Full details of this task's requirements are in the Appendixes. *All formal reports are due Wednesday 20 April* (Week 10).

**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 mark will remain as PE. The requirements for your industrial training and the associated report are available from the Faculty Office (Faculty of Engineering (UNSW) 2006).

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 tutorial 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:  $\text{given-mark} = \text{raw-mark} \times 0.75^n$ , where  $n$  is the number of days late.

## Course Schedule

The schedule for the classes is shown in Tables 2 to 4. Obviously, this schedule is subject to change. Please confirm the schedules for the 3 strands of classes on the WebVista site where schedules can be kept up-to-date.

| <i>week</i> |   | <i>learning focus</i>                                     |
|-------------|---|---|
| 1           | Innovation in Context                                       | technology's requirements & context, organisations        |
| 2           | Ethics 1  | ethical dilemmas in engineering; frameworks & motivations |
| 3           | Ethics 2  | problem identification & resolution                       |
| 4           | Engineering leadership                                      | teams, people & leadership; corporate duties              |
| 5           | Decision-making   | group decision-making; uncertainty & risk                 |
| 6           | guest: T Spooner, ASA<br>+ student-led mini-lectures        | technocratic decisions                                    |
| 7           | guest: A Moore, Ethics C'tee<br>+ student-led mini-lectures | ethical projects: social experiment'n, informed consent   |
| 8           | guest: C Disney, EWB<br>+ student-led mini-lectures         | decisions with scarce resources                           |
| 9           | with P Mort, UNSW<br>+ student-led mini-lectures            | a workshop on answering questions                         |
| 10          | guest: R Hanna, IEAust<br>3 student-led mini-lectures       | engineering as a profession                               |
| 11          | class-test  |   |
| 12          | student-led mini-lectures                                   |   |

Table 2 Anticipated schedule for the plenary classes.

Your seminar class meets 11 times. On each occasion, there will be discussion of ethical issues as they apply in (electrical) engineering practice. The schedule is given in Table 3. Your seminar class is strictly limited to 16 students and presentations will be made by groups of 4 students.

| <i>week</i> | <i>topic</i>         | <i>led by</i>         |
|-------------|----------------------|-----------------------|
| 1           | Engineering Context  | your tutor            |
| 2           | Making Decisions     | your tutor            |
| 3           | Whistleblowing       | your tutor            |
| 4 to 11*    | student-led seminars | group of 3-4 students |

Table 3 Seminar class schedule.

There will be one week without a seminar;  
the particular week depends upon your class.\*

Students also have a second set of tutorial classes with the schedule given in Table 4. For most of these, you will be given preparatory readings & associated questions.

| <i>week</i> | <i>learning focus</i>      |
|-------------|----------------------------|
| 2           | leadership, not management |
| 4           | evaluating technologies    |
| 6           | decision-making            |
| 8           | strategic planning         |

Table 4 Schedule for Tuesday Tutorial Activities.  
Note that there is no class scheduled for the other weeks.

**Assessment dates:** The proposal for the Major Assignment is due Wednesday 8 April (Week 5). Any student who does not submit a proposal will be given a randomly assigned topic for a Formal Report.

Formal Reports must be submitted in Wednesday 20 May (Week 10); self-nominated oral presentations will take place in the allocated time; other Major Assignments must be submitted by the end of the teaching session, i.e. Friday Week 12.

The Mini-Lecture will be given in the assigned time-slot, during a normal Monday lesson (Weeks 6 to 12).

The Class-Test will be in the Monday class-time in Week 11.

The final exam will be held after the end of the teaching session.

## Resources for Students

### Textbooks

#### Prescribed textbook

Books are expensive. There is no single prescribed textbook set for this course.

#### Reference books

Instead, we have identified some excellent reference books that will support your learning.

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 WebVista.

#### 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 by Richard II and Henry V, as presented by Shakespeare (1595, 1599). Musings on such things are as old as human society itself.

### **Books covering assumed knowledge**

n/a

### **DVDs**

In your first 2 hr tutorial, 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 Great Transatlantic Cable* 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.

### **On-line resources**

There will be an active WebVista site for these courses.

Additional on-line resources relevant to these courses:

The Library: [info.library.unsw.edu.au/web/services/teaching.html](http://info.library.unsw.edu.au/web/services/teaching.html)

The Learning Centre: [www.lc.unsw.edu.au](http://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 a business context.

We invite students who find suitable material, including web-sites, to submit these to be made more widely available.

### **The Learning Centre**

The Learning Centre is located in room 231 of the Menzies (Library) Building. 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 (2007), or ask us.

## **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. At the end of the session you will be invited to participate in a voluntary, anonymous survey.

We made use of the judgements of the students of 2008 when changing some of the lecture schedule and some of the in-session learning activities.

Also, as mentioned above, this session the composition, weighting and timing of assessment activities have all been modified, based on the comments and experience of both students and staff in 2008.

The introduction of the students' version of this document was a direct result of discussions with students.

We cannot do anything about either UNSW's policies on assessment and the UoC or the way your degree programs are structured.

The seminar and report topics (listed in the Appendixes) vary from year to year, in response to students' choices.

## **Administrative Matters**

On issues and procedures regarding such matters as special needs, equity and diversity, occupational health and safety, enrolment, rights, and general expectations of students, please refer to the relevant School policies. (see [scoff.ee.unsw.edu.au/](http://scoff.ee.unsw.edu.au/))

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, make sure 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.

Dr Iain Skinner (Course Convener)

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Note: Publishers not given for years earlier than 1960.

## Appendix 1: Seminars Classes

From Weeks 4 to 12, the 2-hr seminar class will be based around a presentation by a group of 4 students on one of the topics listed below. (Each student participates in presenting TWO seminars.) In these presentations, the group is expected to give a *comprehensive coverage of the ethical implications of the topic*. This necessarily involves a description of the problem including a *clear statement of the questions* that you are attempting to answer. Being able to formulate and ask appropriate questions is an important skill and marks are influenced by the quality of your questions. There should be an analysis of various ethical viewpoints that might be adopted in answering your questions and some *conclusions must be attempted*. The group will be *expected to defend the conclusions it draws*. Possible more general ethical implications associated with the topic should be investigated. Students are expected to research their topics.

Presentations are expected to last between 40 and 50 min, and to be followed by general discussion. However, the presentation need not be continuous. It is your presentation; you can arrange it as you see fit; the time is a guideline to how much 'content' we expect you to include. One student in the group will be expected to chair the session and to lead the ensuing discussion. That student need not participate in the formal presentation. All students in the audience will be expected to contribute to the discussion. In particular, *all students in the tutorial class must listen to the presentation and identify a relevant question to ask the presenting group*. If you do not participate, then you will not get participation marks.

Each group must prepare a summary of the ethical problems posed & their conclusions, and distribute copies to all present at the seminar, *at the conclusion of the class*. The pro-forma below is to be used in this summary. Preparation and copying of this summary sheet is the group's responsibility, as is the provision of any audio-visual equipment that is used, except for that which comes with the tutorial room.

Note that simply working through your summary sheet does not make a very interesting presentation.

### Presentations' assessment

In preparing your seminars, take careful account of the following allocation of marks.

Content: technical background & social context (4)

Content: problem identification, ethical reasoning & argument, conclusion (15)

Content: structure, persuasiveness (5)

Presentation: clarity & conciseness (4)

Discussion: leading discussion, answering questions (6)

Teamwork (3)

Acknowledging sources, etc (1)

Summary sheet (2)

This gives a total of 40 and these marks are then divided amongst the group's members in accord with specific information provided by those same group's members. Incomplete groups receive an allowance for being short-handed.

The mark for leading the discussion will be determined by the presenting group's *response to the questions asked* by the other students and the tutor, and asking these suitable questions contributes to the participation mark of the others.

Students *must not read from prepared scripts* in an oral presentation. Working from notes makes it far more engaging and interesting. Remember, students must not commit plagiarism.

### Groups

Your seminar class is strictly limited to 16 students and presentations will be made by groups of 4 students. You can express preferences to help us organise the groups. See the Seminar Group Preference Form. You must submit this to us by 2 pm Fri 20 March (Week 2).

The allocation of seminar topics will then follow. These will be assigned on a random basis and announced in class in Week 3 and on WebVista.

## Student Seminar Topics

Under the general headings given, students are required to *identify some specific ethical questions*, of interest to engineers, and then *attempt to answer* these questions. They are also expected to provide some general ethical material that is background but necessary to understand the topic.

A. *Engineering as social experimentation: surveillance systems*

To what extent are engineers, who develop new technology, responsible for resulting changes in society? What are the engineers' responsibilities if the changes are destructive?

B. *The case of nuclear energy*

Ethical issues associated with energy consumption and related technologies. Reference should be made to the concept of sustainability.

C. *Workplace behaviours*

The workplace involves interpersonal relationships and consequent ethical considerations about behaviour, e.g. bullying, harassment, nepotism, appraisals, rewards, etc. Under Australian legislation, an employer must take "all reasonable steps" to prevent discrimination & harassment in the workplace (Australian Human Rights and Equal Opportunity Commission 2008). UNSW has a set of relevant policies (UNSW 1998).

D. *Genetic screening*

High speed computation allows routine screening of human DNA for a variety of reasons. What limits should be placed on such screening? Who is entitled to know what is found? What does "knowing something" do for/to a person?

E. *Environmental ethics and nanotechnologies*

Reference must be made to IEAust's environmental guidelines (IEAust 1992) and also to the concept of responsible experimentation.

F. *Intellectual property*

The rights and duties of both those who own & those who want to use intellectual property (of relevance to engineering).

*Note and be warned: This is about discussing ethics not laws.*

G. *The world-wide web & virtual communities*

The ethics of this all-pervasive, potentially intrusive telecommunication system. Does Facebook make community and interpersonal relationships easier or harder? What of privacy?

H. *Automated weapon systems*

Ethical issues surrounding the role of engineers in the development and use of weapons. The ethics of having machines make decisions for humans.

## **Pro-forma: Seminar Problem Identification**

At each student-led seminar class, the presenting group must prepare and distribute a single sheet summarising the ethical dilemmas discussed in the presentation. This sheet must introduce ethical problems by briefly providing the following details, for each question raised.

Note: This is not meant to be the prescribed outline of the presentation.

1. Identify the ethical problem.

*Should ... or ...?*

2. List the stakeholders.

3. Identify the ethical principle pertaining to each stakeholder.

4. State the conclusion.

*We think that ... because*

## Appendix 2: Student-Led Mini-Lectures

In this activity you will work in pairs. You have until Monday 23 March (Week 3) to self-organise these pairs. After that time, if you are not in a pair, you will be allocated to pairs.

Each pair will be assigned one of the key readings (specifically, a chapter from a text) associated with this course. *Your task is to give a 10 min presentation to the class, introducing and explaining the key ideas that you found in this reading.*

It is up to the pair of students to decide how the 10 min is used, what aids to employ, what resources are to be distributed to the class or made available on WebVista, etc. However, note that a couple of day's notice is required if you want material printed by the School. After the 10 min presentation, you will be expected to take questions. It is not necessary for both students to speak.

Your presentation will occur in the regular Monday morning class-time. Your day will be allocated to you when the readings are allocated at the end of Week 3. Depending on their readings, students may be allowed to arrange mutually agreeable swaps of time.

### **Presentations' assessment**

In preparing your seminars, take careful account of the following allocation of marks.

Information Content: choice of ideas, how linked to other material, etc (out of 5)

Presentation Method: structure, use of aids, timing, etc (out of 3)

Clarity: eye-contact, grammar, legibility of any visual aids, etc (out of 2)

This gives a total of 10 marks.

Both students involved with the presentation will be given half that mark.

This assessment activity will count as 5 % of the final summative mark in this course.

### **Audience participation**

Those students not presenting are expected to attend and learn. They are also expected to provide feedback to their classmates. This will further develop their teamwork and leadership skills. Remember, professional engineers are required to appraise and provide feedback to their staff.

## Appendix 3: Major Assignment

You are required to complete a major assignment. The default option in this case is a formal report, but *you have the opportunity to design your own assessment task* to demonstrate your achievement of some of the learning objectives in ELEC4122. This task proceeds in two parts.

In PART 1 you design an assignment, explaining what you will do and why. *You submit this proposal for approval before proceeding.*

Approving your proposal involves considering (i) its scope, given the assessment weighting (i.e. 15 %) and the number of people involved, and (ii) how well your proposal matches your stated learning objectives.

In PART 2 you complete this task, *complying with the details of the agreed, negotiated proposal.*

This assignment 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, reviews, etc. Launch your imagination!

If you want to write a Formal Report, though, the criteria are given in the next Appendix, and you do not need to do anything. A topic will be given to you. However, if you want to choose your own topic, then you need to submit the proposal form. All Formal Reports will be individual, not group, projects.

### Possibilities & Scope

To give you some other ideas, possible assignments include oral presentations (nominally 15 min), book reviews, public debates, skits, and critiques of public affairs. However, do not be limited by what is suggested in that list. Any submitted proposal will be considered seriously, at least as the starting point of negotiation.

Note: If you wish to give an oral presentation, there is only a limited amount of time available in timetabled slots. Time-slots will be allocated on a first-come, first-served basis.

As an indication of the amount of effort that is 'expected as fair', consider the specifications of the formal report prescribed below.

As a starting place to identify the sort of topic that might be suitable, consider the topic lists provided elsewhere and also peruse the collected readings distributed in Weeks 1 & 2 in lectures.

### expected student effort:

As a guideline, we expect you to invest about 25 hr per person on this project. Some of your total effort would involve developing the proposal in Part 1. The amount expended on that will depend on the nature of your proposal. For example, a formal report would not take much time, unless the topic is obscure. The approval document for your assignment will show the notional fraction of time spent on developing the proposal.

If you undertake a group project, we will recognise that some of the time allowance will be used managing the internal operation of the group. This is a complicated nonlinear formula: for smaller groups, the cost of group management increases approximately as  $n!$ , where  $n$  is the size. For this reason, I would not encourage a group larger than 3 unless the actual format of the project (e.g. a classic 3 against 3 debate) intrinsically requires the complexity of such staffing.

### Task Specifications — Part 1

The first deliverable is a *project proposal*, in which you detail *what you propose to do and how it demonstrates success in meeting learning objectives*. Of course, you are not expected to demonstrate engagement with all learning objectives in this one task. Composing the proposal necessitates formulating a marking scheme.

If you want to complete a formal report, you can receive a random topic or you can nominate one on the Proposal Cover Sheet.

**proposal's format:**

Once you have decided what to do, you write a brief description detailing the *people involved, what you will produce as a final assessable item, how that item demonstrates achievement of your chosen learning objectives, and the marking scheme* that should be used to determine the success of your project. The format is free because there are so many possible forms of projects. However, you must include sufficient details that the readers can understand what you will be doing, why, and how success will be determined — standard elements of any engineering project.

**your marking scheme:**

Your proposal must include the marking scheme that you suggest we use in assessing your final project. This must include an allowance for relevant elements of your communication skills. In a group project, you may wish to allot some marks for the group's operation. The proposal for a group's project *must include how to divide the marks between members*. The marking scheme is subject to negotiated approval, too, and once agreed will be used to assess the final project. As examples of marking schemes, see the cover-sheets provided.

**Approval Process**

Once you have completed your proposal, submit it for approval. It will be graded satisfactory or unsatisfactory.

If the former, you can proceed. If the latter, you will also receive some suggestions about how it could be modified to comply with assessment needs of ELEC4122. You then need to rework your proposal and try again.

**Task Specifications — Part 2**

You must complete Part 2 as agreed in the approved proposal. It will be assessed against all nominated specifications, in accord with the agreed marking scheme.

**Submission Details**

For PART 1, attach the Proposal Cover-Sheet to the front of your proposal. You only need one proposal per group. This is due

**Wednesday 9 April (Week 5)**

so that you have reasonable time to complete the assignment. However, you are strongly encouraged to get the approval process started sooner. *The sooner you submit, the sooner approved; the sooner approved, the more time available for completing it.*

For PART 2, a suitable originality declaration will be prescribed when you get the proposal approved. Complete this and pay attention to the agreed marking criteria. Due date:

which is the end of session. The standard ELEC4122 penalty applies to later submissions (i.e. 25 % reduction in your mark per day late).

Remember that this task is weighted at 15 % of your summative mark for this course.

## Cover-sheet for proposal

The University of New South Wales  
**ELEC4122**  
Session 1, 2009

### Proposal Cover-Sheet

Complete the details required on this form. Staple it to the front of your report with this side uppermost. Submit your report through the Assignment Drop Box outside Room G12A by **Wednesday 8 April** (Week 5).

*I/we request to complete my/our major assignment in accord with the details provide in the attached proposal.*

OR

*I want to complete a formal report on this topic:*

2cm

| StudentID | name | signature |
|-----------|------|-----------|
|           |      |           |
|           |      |           |
|           |      |           |
|           |      |           |
|           |      |           |
|           |      |           |

date:

This proposal is satisfactory / unsatisfactory.

If satisfactory, then please continue and complete your project.

If unsatisfactory, then please submit a modified proposal taking account of the following comments:

## Appendix 4: Formal Report Requirements

In the absence of another agreed assessment task, students are required to submit a formal written report exploring ethical issues in electrical/telecommunication engineering. Your specific topic will be assigned to you. The report counts as the 15 % major assignment, for your summative mark in ELEC4122.

Your report *must contain a discussion of the ethical issues associated with the topic and related to engineering*. In particular, it must consider both *ethical dilemmas* and *who and how appropriate decisions* should be made about these same questions. It must consider both sides of any argument; it must clearly identify your conclusions about the issues and why you reached them. (*No credit will be given* for surveying the technology or laws involved.)

### Requirements

The main body of the report (including introduction & conclusion) should be  $3000 \pm 10\%$  words; the abstract about 100 words.

Your report *must include some discussion of the IEAust Code of Ethics and its implications* for your particular question, and also some analysis of your question using each of the four ethical frameworks presented in this course: i.e. rights, duties, virtues and utilitarianism.

Students must research their topics. Your references must be sufficient to demonstrate familiarity with the important, current issues, and need to be fully documented. Use the Harvard (i.e. author-date) system for your references. (For more details see The Learning Centre's page on referencing: [www.lc.unsw.edu.au/onlib/ref.html](http://www.lc.unsw.edu.au/onlib/ref.html).)

This report is weighted as 15 % of your final mark in this course. Before writing your report, *take note of the marking criteria* detailed on the Report Cover Sheet (gold, attached to this hand-out) and *review the check-list* on its reverse. Be aware that we can require you to revise and resubmit any report that does not conform to the minimum standards prescribed by the School. (These are included in the information provided to students at [scoff.ee.unsw.edu.au/information/information](http://scoff.ee.unsw.edu.au/information/information)) Any such resubmission will get a maximum mark of 5 out of 10.

Remember, students *must not commit plagiarism*, i.e. they must not use the work of others without proper acknowledgement. Students must identify direct quotations correctly and acknowledge each source at each point that it is directly quoted (or paraphrased) in the text of the report.

### Submission

Your report must be placed in the Assignment Box outside Room G12A, by

**2 pm, Wednesday 20 May,**

with the cover-sheet *completed and attached*. This cover-sheet (gold) is attached to this hand-out. Without it, you cannot be certain that the report will ever get to us! *Late reports will be penalised*, losing 25 % of the marks for each day late. As part of our plagiarism detection system, *you are required to email an electronic copy of your report*. This must be in pdf-format and the file's name must include your student number, in the form `z*****_ethics_report_2009.pdf`. If you do not provide this e-copy, then your report will not be marked.

### REPORT TOPICS

Students who submit a Formal report will have a topic selected randomly from the following list.

1. Reverse engineering
2. The ethics of liability insurance
3. Life support systems [medical, not space exploration]
4. Use of high frequency electromagnetic radiation
5. High voltage power-lines
6. Whistleblowing
7. Professional codes of ethics
8. Technology transfer & sustainability
9. What makes technology appropriate for a specific social context?
10. Planning approvals for large engineering projects
11. Databases and privacy
12. Microchipping people
13. Disposable, repairable or built-in obsolescence?
14. Tissue engineering & stem cells
15. Cybersecurity: whose responsibility?
16. Expert witnesses, forensic engineering. & the courts
17. Transgenic organisms
18. Genetic engineering of bacteria
19. Engineering standards & intellectual property
20. Private ownership of “essential” infrastructure
21. Climate change and greenhouse gas offsets
22. ‘Freedom of Speech’ on the world-wide-web
23. Precision-guided weapons systems
24. Forestry & paper-product industries
25. Email, network-traffic & privacy

## Cover sheet for formal report

THE UNIVERSITY OF NEW SOUTH WALES

**ELEC4122**

Session 1, 2009

### Cover Sheet for Formal Report

Study the marking guide below and the requirements given overleaf. Complete the details required on this form and staple it to the front of your report with this side uppermost. Submit your report through the Assignment Drop Box outside Room G12A, by **Wednesday 20 May**.

name:

StudentID:

*I declare that this assessment item is my own work, except where acknowledged, and has never been submitted for academic credit elsewhere, and acknowledge that the assessor of this item may, for the purpose of assessing this item,*

*(i) reproduce this assessment item and provide a copy to another member of the University, and/or*

*(ii) communicate a copy of this assessment item to a plagiarism checking service (which may then retain a copy of the assessment item on its database for the purpose of future plagiarism checking).*

*I certify that I have read and understood the University Rules about Student Academic Misconduct.*

signature:

date:

| <i>critierion</i>  | <i>weight</i> | <i>mark<br/>of 10</i> | <i>part<br/>mark</i> |
|--|---------------|-----------------------|----------------------|
| FORMAT<br>physical presentation, legibility & layout; the report must be stapled or comb-bound with this page at the front; folders should not be used.  | 0.05          |                       |                      |
| STRUCTURE<br>abstract, table of contents, numbered sections (with headings), including introduction & conclusions, performing their respective functions; diagrams & tables numbered, with captions, & discussed in the text.                                      | 0.2           |                       |                      |
| LANGUAGE USAGE<br>Standard of writing (grammar, spelling & punctuation); expression (fluency, correct word choice, conciseness, avoidance of clichés); style (degree of formality; see overleaf); conventions (SI units, etc; see overleaf).                       | 0.2           |                       |                      |
| REFERENCING<br>fully documented references; correct use of citations (Harvard convention); identification of all sources of information, incl diagrams & tables, wherever paraphrased or quoted in the text of the report; direct quotations correctly identified. | 0.05          |                       |                      |
| CONTENT<br>quality of question (relevance, explanation); 'ethical' arguments (balance, depth, relevance; adequate references, synthesis; use of IEAust Code & 4 frameworks); quality of conclusions (relationship to content, summary value).                      | 0.5           |                       |                      |
| TOTAL  | 1.0           | -                     |                      |

marking scale: 1-3 poor, 4 marginal, 5-6 satisfactory, 7 good, 8 very good, 9-10 excellent.

The overall mark is the weighted sum of the marks for the components, as described above.

1. You must not commit plagiarism. Any report considered to contain plagiarism will be passed to the Head of School for further action. (see [www.lc.unsw.edu.au/plagiarism/index.html](http://www.lc.unsw.edu.au/plagiarism/index.html))
2. Late submission of this report will be penalised, at 25 % per day late.
3. If your report is unsatisfactory (i.e. not suitable for a professional engineer), then you may be required to resubmit an amended version. A report can be judged unsatisfactory for ANY of these reasons:
  - (i) use of units not conforming to SI standards;
  - (ii) use of discriminatory or non-inclusive language;
  - (iii) failure to follow correct referencing conventions;
  - (iv) a consistently inappropriate style (e.g. as though written for school-children, a sales brochure, or a tabloid newspaper, rather than for professional engineer to read);
  - (v) failure to have an appropriate structure (abstract, introduction, conclusion, etc.); or
  - (vi) unreadable text, symbols, or figures.

---

The following checklist will assist with various aspects of preparing your report. Before submitting, check these issues. They are requirements.

- The report is securely assembled with this cover-sheet, completed and signed, as the front page.
- The report is legibly written in ink (blue/black) or printed in 12 pt type on A4-paper (single-sided). Pages are consecutively numbered.
- The report is the specified length. I have attempted to make it concise (i.e. “brief but comprehensive in expression” — *Concise Oxford Dictionary*).
- The report is intended to be understood by someone less well versed in the topic than the author. It does not verbosely repeat material from the references. It attempts to convey to the more informed reader the extent of the author’s understanding of the topic.
- There is a title-page, which includes the name of the author, title of the report, the course code & name, and the date, following this cover-sheet.
- The Abstract and Introduction fulfill their purposes, as conventionally understood (i.e. the abstract stands on its own as a summary of the report, whereas the introduction states the issues, places them in context and, perhaps, suggests the general line of argument, the scope of the following sections, and the conclusions).
- The Conclusion summarises and assesses the arguments, emphasises the more important ones, and mentions unresolved issues.
- The sections of the report are numbered and appropriately titled. If they are used, tables, diagrams, etc. are also clearly numbered.
- There is a Table of Contents following the Abstract and on a page of its own.
- The references are contemporary, cover the breadth of the topic, and demonstrate my familiarity with its major aspects. References are correctly included in the body of the report.
- The report has been proof-read and spelling, grammar, & punctuation have been checked.
- Acronyms & jargon are either avoided or clearly explained.
- Inclusive & nondiscriminatory language is used throughout.
- Units & their abbreviations conform to SI standards.