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# Ethics Case Studies: Placing Ethical Practice in an Engineering Context

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## Workshop Overview

Ethics in engineering is a topic which is rapidly moving up the teaching agenda. The current challenge faced by engineering educators is how to teach ethics in a way that is consistent with the needs of their students. This workshop will introduce participants to a teaching resource which enables ethical content to be introduced to students in engineering.

Workshop activities will include the first-hand experience of an ethics case study, introduction to a database of case studies and other electronic resources for teaching ethics and the opportunity to discuss the challenges of teaching ethics to engineers with experienced practitioners.

## Workshop Rationale

### Introduction

Developments such as the publication of Royal Academy of Engineering's *Statement of Ethical Principles* show that engineering Institutions are taking the issue of ethics seriously. The UKSPEC document also requires that engineering degree courses should develop and enhance students' "understanding of the need for a high level of professional and ethical conduct in engineering". This indicates that ethics in engineering education also has a rising profile.

### Case Studies Pedagogy

The value of case studies in teaching ethics to students from engineering backgrounds has been recognised by several authors (Wareham *et al*, 2006; Johnston *et al*, 2000; Whitbeck, 1993). All of these authors note that the methods usually employed for teaching ethics to engineering students are ineffective and inappropriate: Ethics material is usually concentrated into one course or module which is often taught by someone outside of the engineering school or faculty. Moreover, such courses often introduce ethics using a highly general and theoretical approach by concentrating first on ethical theories rather than on the practical applications of such theories. This approach often alienates engineering students. Because ethics is delivered in a separate course by non-faculty staff they regard it as something separate from the 'proper engineering' content of their degree and do not take it seriously; approaching the subject from a theoretical perspective also jars with the engineers' practical mindsets. Case studies, on the other hand, focus on individual ethical dilemmas viewed in a practical engineering context. They form an ideal basis for short teaching sessions that can be delivered alongside more traditional engineering content. Teaching ethics using case studies therefore ensures that students regard ethics and ethical issues as part of the engineering curriculum, and part of the life of the engineers, rather than as an optional extra. Using real life examples, case studies illustrate that ethics is a live subject with practical application. Pedagogical research therefore supports the use of case studies when teaching ethics to engineering students.

## The Need for Case Studies

A recent report from the Royal Academy of Engineering surveyed the existing practice of teaching ethics to engineering students in UK university engineering departments. This report concluded that “There is an overwhelming need for case study material that engages the students, particularly stemming from UK experience”. 98% of those surveyed agreed that case studies would be either ‘helpful’, ‘very helpful’ or ‘critical’, for the teaching of ethics to engineering students.

In conjunction with the engCETL and Engineering Subject Centre at Loughborough University, the Inter-Disciplinary Ethics Applied CETL at the University of Leeds has developed a database of case studies in engineering ethics. This responds to the need for UK-based examples of ethical issues which commonly arise in engineering settings. Because of an awareness that in many institutions a major hurdle to the delivery of ethics will be a lack of ethicists, these resources have been developed with full teaching notes and are structured to support non-ethicists in the delivery of ethics teaching sessions which can be integrated into existing curricula. This new database of cases which will be introduced to participants therefore offers a unique resource in this field.

## Research in Engineering Ethics

Aside from the value of teaching ethics to engineering students, the field of engineering ethics is increasingly recognised as a legitimate area of academic research. Since the late 1980’s, the academic interest in engineering ethics and related topics has been rising, resulting in the creation of a journal specifically devoted to the topic (*Science & Engineering Ethics*) as well as the publication of seminal articles focusing on the more theoretical and philosophical aspects of the topic in other prestigious academic journals (in particular Davis (1991) and Johnson (1992))

This workshop therefore offers participants the opportunity to benefit from a much needed teaching resource in an important and emerging area of engineering education.

## Session Activities

Presentation: The effectiveness of using case studies to teach ethics

Group activity: participation in an ethics case study

Discussion: feedback on the case study experience and the experience of teaching ethics more generally

Demonstration: how to access the case studies database and other electronic resources for teaching ethics

## Aims of the Workshop

To enable participants to:  
understand why it is valuable for students to develop ethical thinking and reasoning skills  
experience a case study aimed at introducing ethical issues to students in engineering  
consider ways of using case studies in particular discipline and institutional contexts  
provide feedback to the developers on how the resources might be further developed, and  
indicate where additional ethics case studies might be useful.

## Expected Outcomes

Participants will:

develop an understanding of why it is valuable for students to develop ethical thinking and reasoning skills, and have gained knowledge of one model for achieving this.

receive a sample case studies session from the database including tutor notes and guidance, and learn how to access the website and register to use the database.

learn how ethics might be integrated into their module and/or programme of study.

learn from other participants about their experience of integrating ethics.

## References

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