

Teaching Engineering Ethics to Freshmen

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ABSTRACT: *In the 2004-2005 academic year, the Faculty of Science and Technology at the Meijo University in Japan will introduce a course titled "Engineering Ethics," as part of implementing the Japan Accreditation Board for Engineering Education (JABEE) Criteria 2004-2005. The lecture is targeted at freshmen who are quite interested in science and technology, but do not have enough sensitivity to engineering professionalism. This situation requires us to develop engineering ethics education to motivate the students to understand that engineering ethics is professional ethics.*

This paper describes our concept of the course, and includes the syllabus and daily schedule.

1 INTRODUCTION

In 1999, the Japan Accreditation Board for Engineering Education (JABEE) was established to advance the globalization of engineering education. JABEE administers the accreditation criteria to the engineering programs seeking accreditation, including a clause addressing engineering ethics. This criterion requires the programs to establish a learning objective for an "understanding of the effects and impact of technology on society and nature, and of engineers' social responsibilities". In the 2004-2005 academic year, the Faculty of Science and Technology at the Meijo University plans to introduce a freshman-level course in engineering ethics as part of meeting JABEE's requirement.

2 BACKGROUND

In Japan, students at schools of science and technology do not expect to learn ethics. In general, these students, and freshmen in particular, lack a sense of professionalism as it pertains to the engineering field. The engineering faculty must therefore present engineering ethics education in a way that will convince these future engineers that they have to be not only technically competent, but socially accountable in their careers.

3 OUR SYLLABUS AND DAILY SCHEDULE

For these reasons, we have developed the syllabus and daily schedule for the engineering ethics course.

Course goals for the engineering ethics course:

- To learn ethical reasoning through practical situations.
- To understand the engineering profession.
- To recognize ethical issues that engineers face.
- To develop the analytical skills to solve ethical dilemmas.

Required Text:

K. Kuroda and K. Todayama ed., *Hokori-Takai-Gijyutsusha-ni-Narou: Kougaku-Rinnri-no-Susume* (An Encouragement of Engineering Ethics: becoming a proud engineer), Nagoya University Press, 2004.

Reports:

- To clarify ethical issues for engineers.
- To identify engineers' social responsibility.
- To propose solutions to ethical issues.

Examination:

Trial for the first stage examination for professional engineers, Japan's license.

Daily Schedule:

Class1 Course overview.

Class2 Common moral problems and solutions.

Class3 Ethical issues in ordinary affairs of life1.

Class4 Ethical issues in ordinary affairs of life2. Cases.

Class5 Ethical issues in ordinary affairs of life3. Reports.

Class6 Ethical issues on the Internet. Feedback about the reports.

Class7 Ethical issues of safety and engineers' responsibility1. Cases.

Class8 Ethical issues of safety and engineers' responsibility2. Report.

Class9 Ethical issues of safety and engineers' responsibility3. Feedback about the reports.

Class10 Ethical issues in information management1.

Class11 Ethical issues in information management2. Cases. Report.

Class12 Ethical issues in information management3. Feedback about the reports.

Class13 Ethical issues in corporations1.

Class14 Ethical issues in corporations2. Reports.

Class15 Examination.

As you can see from the daily schedule, apart from the final session, the course consists of four parts: Classes 1 and 2; Classes 3, 4, and 5; Classes 6, 7, 8, and 9; and Classes 11, 12, 13, and 14. The first part of the course introduces engineering ethics. The second part presents ethical problems that students may confront. Students are expected to recognize and solve ethical problems. In the third part of the course, students are exposed to ethical issues that technological products pose to consumers. Students learn about ethical problems that involve product safety and Internet privacy. The final part of the course concentrates upon the recent professionalism of engineering in Japan. Students are expected to learn the responsibility that professional engineers have to their colleagues, employers and to the public. In Classes 5, 8, and 11, the heart of Parts 2, 3, and 4, students submit written reports on what they have learned. Feedback about the reports will be provided in the class immediately following the one in which the reports were submitted.

4 CONCLUSIONS

The faculty of Science and Technology at Meijo University plans to offer the engineering ethics course as part of implementing JABEE's Criteria 2004-2005. The concept of engineering as a profession is new to students at institutions of science and technology in Japan. This situation provides us with the opportunity to develop a syllabus and daily schedule that engineering students will easily understand. With certain improvements, we can help students develop a sufficient "understanding of the effects and impact of technology on society and nature, and of engineers' social" to satisfy the criteria with the syllabus and daily schedule.

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