

Development of Introductory and Engineering Ethics Education for Fresh Engineering Students in Japan

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After working in industry for thirty seven years in industry as an engineer and management, one of the authors was asked in 1996 by Kanazawa Institute of Technology to develop a subject titled “Society and Engineers” for freshmen which includes engineering ethics.

Investigation of graduate students of the Institute revealed that they regret very much in their way of life during the undergraduate study because of lack of some of the basic knowledge like what and who are engineers, what is going on in the world and society and role of engineers in society and consequent lack of incentive to study during an early undergraduate period.

This clearly indicates it essential for the students to learn and understand these at an very early stage and to finish these before they study engineering ethics at latest.

The subject of “Society and Engineers” (3 classes x10 week in all, one hour each:3units) , therefore, consist of following three components;

1. Items to be taught in the class

1) What are engineers? :based on EC2000 of ABET

2) What is going on in the world and Japan?

3) Relationship between society and corporation and Corporate Social Responsibility

4) R&D and processes new product is made

5) Engineers and laws :PL, Patent, Anti-monopoly laws

6) Engineering Ethics and Corporate Ethics

Case studies of 3 accidents in Nuclear Development in Japan

Sodium metal leak and fire at Monju fast breeder test reactor

Fire and explosion at spent fuel treatment plant

Criticality accident at JCO

7) Engineers’ life in other countries: U.S. and Asian countries

8) Starting one’s own company

9) Life planning for engineers

2. Students' assignments

- 1) Write a three page report on their life after reading a book on positive thinking.
- 2) Read a newspaper and pick up ten social topics of one's interest in a week and summarize each into one sentence and repeat this ten times for ten weeks
- 3) Write a three page report on the world and Japan and one's life plan

3. Write reports after viewing Video programs

- 1) Intranet in office work environment
- 2) Cell production system
- 3) Story of development of ink jet printers in Canon
- 4) Fast breeder reactor accident

The objectives of the subject are to make students study and understand the society in which they will work and obtain by themselves motivation to study in the Institute.

The textbook, "Becoming and being engineers" was made to cover the 9 items described in 1. in 1997 and published in 1998 and revised the contents in 2000, 2002 and 2004.

About 3500 students has taken the compulsory-elective subject in eight years and fourteen other engineering schools used the book as a textbook or a reference in Japan in 2003.

Although the authors have received very positive responses from the students, the evaluation of the subject by the students was made and analyzed. All the three components above described were found to contribute and help students think their own lives, and understand and motivate their study.

The Institute hired four professors and made the subject now titled "Introduction to Engineers"(1 classx30 weeks: 3units) compulsory for all 1700 incoming freshmen from April, 2004 and necessary re-arrangements are being made.

