Professional Ethics in Software Engineering Curricula

Gordana DODIG-CRNKOVIC
Ivica CRNKOVIC

Department of Computer Science and Electronics, Mälardalen University, Västerås, Sweden
gordana.dodig-crnkovic@mdh.se; ivica.crnkovic@mdh.se

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Swedish Computer Science and Engineering education follows broadly an international model, expressed in the American ACM/IEEE Computing Curriculum.

http://www.computer.org/education/cc2001/index.htm

Typical general knowledge subjects that are widely represented are Theory of Science (Philosophy of Science) and Research Methodology.

However, the education in Professional Ethics, that is a compulsory part of ACM/IEEE Computing Curriculum is as a rule absent.
Computing Curricula ACM/IEEE

- Social context of computing
- Methods and tools of analysis of ethical argument
- Professional and ethical responsibilities
- Risks and liabilities of safety-critical systems
- Intellectual property
- Privacy and civil liberties
- Social implications of the Internet
- Computer crime
- Philosophical foundations of ethics
The high level of media attention given to computer-related disasters in technical systems has increased interest in Computer Ethics: The Increasing General Public Awareness on Ethical Aspects of Technology.

- The Therac-25 computerized radiation machine overdoses.
- The explosion of Ariane V in 1996.
Why Ethics?

“There are few things wholly evil or wholly good. Almost everything...is an inseparable compound of the two, so that our best judgment of the preponderance between them is continually demanded.”

Abraham Lincoln
Ethics Contexts

- Clients
- Consumers
- Industry (Other firms)
- Profession (Societies)
- Engineering firm
  - Engineer
  - Colleagues
  - Managers
- Family (Private Sphere)
- Global environment
  - Society/Nature
“All products of technology present some potential dangers, and thus engineering is an inherently risky activity. In order to underscore this fact and help in exploring its ethical implications, we suggest that engineering should be viewed as an experimental process. It is not, of course, an experiment conducted solely in a laboratory under controlled conditions. Rather, it is an experiment on a social scale involving human subjects.”

Social Importance of Engineering

Engineering has a direct and vital effect on the quality of life of people. Accordingly, the services provided by engineers must be dedicated to the protection of public safety, health and welfare.
Why is the Professional Ethics Important for Computer Scientists and Engineers?

Because the Professional Ethics shall be a part of education for every socially important profession, as one of essential constituents of the meaning of the term professionalism!
Codes of Professional Ethics

A code of professional ethics appears when an occupation organizes itself into a profession. It is central to advising individual professionals how to conduct themselves, to judging their conduct, and to understanding of a profession.
Teaching Professional Ethics to Computer Science Students

The most important goal is to develop the *ethical autonomy*, i.e. the ability and the habit to think rationally and critically about the ethical questions.
Professional Ethics in Science and Engineering Course at Mälardalen University

- What Is Ethics?
- Ethics vs. Morals
- Ethics: A Pluralistic Approach to Moral Theory
- Is Computer Ethics Unique in Relation to Other Fields of Ethics?
- Codes of Ethics and Professional Conduct
- Engineering as Social Experimentation
- A Framework for Ethical Decision Making
- Types of Ethics Inquiry
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The examination forms for the course were the writing of a research paper on an ethical topic of interest and an oral presentation of a chosen topic (such as safety and security, intellectual property, environmental ethics, privacy etc.) followed by an in-class discussion led by the students responsible for the actual presentation.
Professional Ethics Course Evaluation

- First three years experiences very positive
- Students actively participating into discussions, case studies and research on chosen topics
- Interest even in general ethical concerns of other fields like medical ethics or arms control
- Even predominantly technical-minded students are able to assimilate and use philosophical concepts introduced by the theoretical part of the course

See more under:
http://www.idt.mdh.se/kurser/cd5590/03_11/CourseEvaluationCharts.pdf
Two industrial PhD students have included specific chapters on ethical aspects of their work in their PhD respective Licentiate Theses as a consequence of taking part in the Ethics course. They have related technological issues such as product integration and component-based design to stakeholders’ attitudes and decisions based on the ethical premises of the engineering in particular activities in the software development process.
Three other students have published articles on their field of interest in international journals and at CEPE and E-CAP conferences which attracted the interest of the computing and philosophy community to ethical issues related to Software Engineering.
Next year the extended version of the course will be given as a part of doctoral education for all MDH PhD students.

MDH Professional Ethics Course Home Page:

http://www.idt.mdh.se/kurser/cd5590