

Course syllabus: Course Module 9
Northern Institute of Technology
Hamburg Technological University-Harburg

Engineering Ethics Seminar

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June 5-7, 2009

Course objectives:

1. To familiarize students with important moral issues common in engineering (including the special responsibilities of engineers);
2. To provide students with tools for analyzing those issues;
3. To give students enough experience with the use of those tools to feel reasonably confident that they can resolve similar issues properly in a work environment either on their own or in cooperation with others, whether engineers or non-engineers.

Course requirements

1. Attend class (and participate in class discussion)
2. Read assignments *before* the day they are due
3. Take final exam at 4 pm last day of class
4. Complete problem-solution paper by the end of June 12 (Hamburg time).

Recommendation:

Bring personal laptop to class every day. To be able to use wireless internet access in the classroom, follow instructions on the page of the TUHH website before the first day of this seminar: <http://www.tu-harburg.de/rzt/vpn/wlan/>.

All “handouts” should available at this site except a) handouts designated “in class” which will become available only during the relevant class and b) documents listed below with urls, which may have to be accessed directly from the site listed.

June 5, 2009 (Fri): Introduction

Readings (do before class)—available with other class materials as “handout” on web:

- 1) Davis, “Technology, Values, and Ethics”
<http://ethics.iit.edu/publication/TechnologyandValues.pdf>
- 2) Davis, “Do the Ethics of Chemists and Engineers Differ?”
<http://www.hyle.org/journal/issues/8-1/davis.htm>
- 3) National Society of Professional Engineers (NSPE) Code of Ethics (US)
<http://www.nspe.org/Ethics/CodeofEthics/index.html>
- 4) European Federation of National Engineering Associations (FEANI) Code of Ethics
<http://www.tendrup.dk/feani.htm>
- 5) *Hydrolevel v. ASME*
<http://ethics.tamu.edu/ethics/asme/asme1.htm>

Recommended Readings (useful but *not* required)—available only at website

- 1) Didier, “Why There are No Engineering Ethics in France: A Historical Interpretation”
<http://onlineethics.org/CMS/profpractice/ppessays/internindex/Historical.aspx>
- 2) Smith, “Conduct and Ethics in Engineering Practice Related to the North American Free Trade Agreement”
<http://onlineethics.org/CMS/profpractice/ppessays/internindex/8872.aspx#background>
- 3) Hiroshi Iino, “Three Teaching Case Studies of Accidents in Nuclear Energy Development in Japan”
<http://onlineethics.org/CMS/edu/instructessays/japancases.aspx>

Assignment for first day. Do readings above and be prepared to answer questions about profession of engineering in your own country. (See 17:00-18:00 below.) Do a little research if necessary to avoid saying, “I don’t know anything.”

9-13 What is Engineering Ethics?

- Engineering?

Case: Catalyst B (part 1) (handout)

- Ethics/ morality
- Ethics/ law
- Seven step method

Case: Catalyst B (part 2) (handout out in class)

13-14 Lunch

14-17 Profession, Codes of Ethics, and Technical Standards

Case: Catalyst B (part 3 and 4) (handout in class)

Case: Steel Frame Design (handout)

Role of professional societies and government

Case: *Hydrolevel v. ASME*
See Reading above

17-18 Tell what you know about engineering in your own country

Word for “engineer”? “Engineering”?

Are there any engineering societies?

Are they professional societies?

Do they write standards?

Who may join?

Assignment for Second Day. Review *Hydrolevel* case above, read Pinto case below, and recall at least one ethical issue that arose while practicing engineering.

June 6, 2009 (Sat) Obligations to Clients and Employers

Readings: Pinto

<http://www.cs.rice.edu/~vardi/comp601/case2.html> (required)

<http://online.ceb.com/CalCases/CA3/119CA3d757.htm> (full legal case—recommended)

9-12 Loyalty, conflict of interest, the role of the engineer

Case: *Hydrolevel v. ASME* (cont.)

Case: “No Damage” Damages (handout)

12-13 Lunch

13-17 Quality, risk assessment, and product liability

Case: Price is Right? (handout)

Case: Wonderful? (handout)

Case: Pinto

17-18 Ethical problems you have experienced practicing engineering

Assignment for Third day. Do readings below and prepare a 250+ word essay on “What I learned about engineering ethics from this course so far.” Pass (if turned in)/Fail (if not turned in). **Purpose** is to help you pull together what has happened so far.

June 7, 2009 (Sun) Obligations of Public and Others

Reading: Davis, “Some Paradoxes of Whistleblowing”

<http://ethics.iit.edu/publication/bib.html#P> (P-0026)—download

Reading: Davis, “Thinking like an Engineer”

http://www.iit.edu/departments/csep/publication/md_te.html —download

For Citicorp details (recommended), see: Davis, ed. *Engineering Ethics*, pp. 181-189, or

<http://www.onlineethics.org/CMS/profpractice/exempindex/lemesindex.aspx> or

http://en.wikipedia.org/wiki/Citigroup_Center

9-12 Whistleblowing and its alternatives

Case: *Gilbane Gold* (VCR)

Case: Citicorp (handout)

12-13 Lunch

13:30-16:30 client, worker safety, environment, sustainable development

Case: Quality Control at Clark Engineering (handout)

Case: Grinding Wheel (handout)

Case: Waste Disposal (handout)—group project? (if time is short)

Case: Self-Opening Wastebasket (handout) —group project

16:30-17:00 In-class exam

17:00-17:30 Closure

Explanation of Problem-Solution Paper (take-home)

Answers to exam questions

General debriefing

Final Assignment: Prepare problem-solution paper according to instructions and submit as email attachment within one week of end of class.

USEFUL Websites:

<http://ethics.iit.edu>

<http://www.onlineethics.org>

<http://engineeringethicsblog.blogspot.com/>

<http://www.nspe.org/Ethics/EthicsResources>

USEFUL Journals

Science and Engineering Ethics

USEFUL Books

Davis, *Thinking like an Engineer* (Oxford, 1998)

Davis, ed. *Engineering Ethics* (Ashgate, 2005) [a very useful collection of important works in engineering ethics]

Fleddermann, Charles, *Engineering Ethics* 3rd (Prentice Hall, 2007)

Harris, Pritchard, and Rabins, *Engineering Ethics: Cases and Concepts* 4th (Wadsworth, 2008).

Pinkus, Shuman, Hummon, and Wolfe, *Engineering Ethics: Balancing Cost, Schedule, and Risk; Lesson Learned from the Space Shuttle*. (Cambridge University Press, 1997).

Schinzinger and Martin, *Ethics in Engineering* 4th (McGraw-Hill Higher Education, 2004).

Unger, *Controlling Technology: Ethics and the Responsible Engineer*, 2nd ed (Wiley, 1994).