

**Course offered for the PhD program
in Civil, Chemical and Environmental Engineering
Soft Skills a.y. 2024/2025**

(course is open for participation of students from other PhD cycles or programs)

1. Title

Ethics and Engineering

2. Course Description

In this course, we will inquire into the problems of ethics by starting with engineering cases that raise ethical quandaries and bringing to light the deep issues that underlie them. We will then go on to investigate these deep issues through a study of some of the great thinkers on ethics.

This course takes the approach that engineering is not merely about design and implementation. Engineering aims at goods for both the individual and for society, and the thoughtful pursuit of engineering necessitates an understanding of those goods and therein an understanding of both the individual and of society. The readings that we will study are by people who achieved this understanding to the highest degree.

In joining this course, PhD students will gain an understanding of the fundamentals of ethics and solutions to ethical problems in engineering. The ultimate objective is for students to have a transformative experience in their ethical thinking.

3. Course Organization

Frontal lessons and discussion in class. Students are encouraged to do the readings for each class before it begins.

4. Teacher

Dr. Alberto Ghibellini

5. Duration and credits

6 hours overall, 3 lessons of 2 hours each.

Credits (DICCA PhD program, soft skill courses): 1 CFU

6. Activation mode and teaching period

Classes are scheduled on: May 7, May 15, May 20 from 3:00 to 5:00 pm.

7. Deadline for registration

May 2, 2025. Application: email message to the teacher

(aghibell@mit.edu) and the PhD Program Director, Prof. Roberta Massabò (Roberta.Massabo@unige.it).

8. Final exam

Short written report on one of the course topics. The report must be turned in via email (as a PDF attachment) to the following email address:

aghibell@mit.edu

Syllabus:

1. *What is Ethics?*

Case study: Bhopal

Materials: AIChE *Code of Ethics*; Selections from Fleddermann's *Engineering Ethics* on Ethics Theories

Study Questions: What are the premises and aims of the AIChE Code of Ethics? Apply it to the Bhopal case. Is it ethically effective? Why or why not?

2. **Utilitarianism**

Case studies: Ford Motor Company Memo; Why Self-Driving Cars Must Be Programmed to Kill (<https://www.technologyreview.com/s/542626/why-self-driving-cars-must-be-programmed-to-kill/>).

Materials: Bentham, *Principles of Morals and Legislation*, Ch. 1, 4.

Study Questions: What are the central tenets of utilitarianism? Is utilitarianism compelling? What makes it ethical? Apply it to the cases. How is it helpful? Are you a utilitarian? Why or why not?

3. **Kantian Duty Ethics**

Case Study: Bhopal and Ford Case revisited

Materials: AIChE Code of Ethics; Kant, *Groundwork of the Metaphysics of Morals*, Chapters I, II.22.

Study Questions: What is ethical according to Kant? What is meant by a duty or dignity? How does the duty-ethical approach differ from that of utilitarianism? In what ways is the AIChE Code of Ethics based on Duty Ethics and in what ways is it not? Apply the approach to the Bhopal and Ford Motor Company cases. What would it advise? Are you a duty-ethicist? Why or why not?

4. **Rights Ethics**

Case Studies: "Ethics and Clinical Research," Beecher, H.K., *NEJM*, **274**, 1354 (1966).

Materials: Hobbes' *Leviathan* I.xiii, I.xiv (until the paragraph "The Second Law of Nature"); John Locke, *Second Treatise*, Chapter II, sections 4-12, Chapter VIII, sections 95-99, Chapter IX, sections 123-124 (first two sentences), Chapter XIX, section 222. US Declaration of Independence (first two paragraphs).

Study Questions: What is meant by natural rights? How are they like or unlike duties? What are our natural rights according to Hobbes? According to Locke? What is the basis of government according to Locke? Why is Rights Ethics connected with property and with politics? Apply the rights approach to the cases. Do you believe in natural rights? Why or why not?

5. **Aristotelean Virtue Ethics**

Case Study: Kremer, "(Re)examining the Citicorp Case: ethical paragon or chimera?" *Practice*, **6** (2002), pp. 269-76.

Materials: Aristotle, *Nicomachean Ethics*, Book I.1-5, 7, 13; Book III. 6-9; Book IV.1; Book X.9 (only last paragraph, 1181 b, lines 13-23); Aristotle's list of virtues.

Study Questions: Where does virtue fit in Kremer's analysis? Do you think the behavior he describes was virtuous? What is virtue according to Aristotle? How does the Aristotelean approach differ from that of the others we have previously studied?

6. **Review and Conclusion**

Case Study: "The Place of Engineering in Society and Civilization," W. K. Lewis, *Technology Review*, p. 31 (1969).

Study Questions: What is Lewis' vision for the engineer and the ethics of the engineer? How does it square with the ethical theories we have so far examined? Do you agree with him? Why or why not?