

# Ethics and the Technical Professions

Dr. Michael Hoffmann

## Focus

This class focuses on three sets of problems:

1. Important dimensions of professional ethics
2. Meta-ethics:
  - The main strategies of ethical argumentation: Deontological and utilitarian approaches; social contract theories; discourse ethics; virtue ethics; care ethics.
  - Concepts: good and bad, ethics, morality, principle, value, virtue, justice, fairness, utility, purpose, theological voluntarism, cultural relativism, social practices, intuitionism, etc.
  - Problems of ethical sensitivity and argumentation: principal limits; conditions; cognitive problems like habits of thinking, stereotypes, group think, social structures, framing, and mental models.
3. Training in ethical argumentation by means of case studies from engineering, technology, and science.

## Learning by doing

Although this is a big class, its success will depend on your contributions and engagement. Besides a lecture part about the meta-ethical issues listed above on Tuesday, we will work in two different forms: class discussion and group work. The second half of our class meetings on Tuesday will be reserved for discussions about readings that will introduce you to important dimensions of professional ethics. To prepare these discussions, you have to read the texts that are listed for each week in the schedule below, and you have to answer a few questions that allow us to focus on the readings' central points. You will find these questions in T-Square (under "Assignments"). Your job is to read the texts, answer all these questions in about one page, and submit it via T-Square **before** class on Tuesday. The idea is that we are best prepared for our discussions when we have already grappled at home with the ideas we will focus on in class.

On Thursday, we will mainly work in small groups to train ethical argumentation. This training includes three components:

1. Analyze case studies or ethical argumentations. You have to read the material and submit individually a first map presenting the central argument, or a central position, **before** you come to class.
2. Reconstruct the argumentation, or develop an argumentation based on the material, in your group by means of Logical Argument Mapping (LAM). LAM is an argument visualization method that allows us to structure complex argumentations, reflect on their limitations, and deepen our understanding of the problems involved. Moreover, it stimulates the formulation

of objections and new arguments which can lead to refinements, further differentiations, restructuring and reframing, simplifications, and learning. We will use Logical Argument Mapping as a standard of argument representation that facilitates communication, deliberation, and decision making. That means, we will try to translate all sorts of texts and material into an argumentative form. During the first weeks of class, we will learn how to use LAM.

3. Represent, as a group, your argument map and discuss it with seven other groups. Image being an expert commission briefing a committee of politicians.

If possible, bring a laptop to class on Thursday. We will do the Logical Argument Mapping with cmap, a freely available software tool that allows synchronous collaboration on maps (see “Tools”).

## Readings

*Books to buy at the Engineers Bookstore:*

- Harris, C. E., Pritchard, M. S., & Rabins, M. J. (2009). *Engineering Ethics: Concepts and Cases (Paperback) (4. ed.)*. Belmont, CA: Wadsworth, Cengage Learning.
- Gorman, M. E., Mehalik, M. M., & Werhane, P. (2000). *Ethical and Environmental Challenges to Engineering*. Englewood Cliffs, N.J.: Prentice Hall.

*Required readings on T-Square (folder “Resources”)*

- Economist (2009). Debris in space. Flying blind. The tragedy of the commons meets the final frontier. Economist, [http://www.economist.com/opinion/displaystory.cfm?story\\_id=13144943](http://www.economist.com/opinion/displaystory.cfm?story_id=13144943).
- Hoffmann, M. H. G. (2009). Visualizing Ethical Controversies and Positions by Logical Argument Mapping (LAM) – A Manual. *Georgia Tech's School of Public Policy Working Paper Series, 50*, online: <http://www.spp.gatech.edu/faculty/workingpapers/wp50.pdf>. Print and bring to class for the test on June 2<sup>nd</sup>, and each Thursday.
- Vaughan, D. (1997). *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA*: University Of Chicago Press. (Excerpt 1 and 2)
- Zimbardo, P. G. (2007). Revisiting the Stanford Prison Experiment: a Lesson in the Power of Situation. *The Chronicle Review, 53*.

*Theoretical Background (if you are interested)*

- Waller, B. N. (2007). *Consider Ethics. Theory, Readings, and Contemporary Issues* (2nd ed.). New York: Peasons-Longman.

## Tools (links are in T-Square, folder “Resources”)

- Cmap (<http://cmap.ihmc.us/>), the freely available software we will use for Logical Argument Mapping. Please download from: <http://cmap.ihmc.us/download/>. Cmap allows synchronous collaboration on maps that are saved on the cmap server. To get access, go to “Shared Maps in Places” in cmap, then open “IHMC Public Maps (3),” then “users,” then type the beginning of “Georgia Tech PST 3109.” Add this folder to “Favorites” by right-click for quick access in the future. Within this folder, you can create your own folders, and you will find a folder “LAM schemes” with all the argument schemes for copy and paste.

- LAM manual online at <http://www.prism.gatech.edu/~mh327/LAM/>.
- “Tools for Philosophy.” A document that lists encyclopaedias (books and online) that can help if you have problems with philosophical terminology. See also <http://philosophy.gatech.edu/>.

## Group Projects

Please go to “Polls” in T-Square and choose two different projects. Details for the projects are described below. **Deadline for the polls is May 19!** Make a note regarding your choice so that you know where to sign up later. Based on your preferences, we will establish “Lab sections” in T-Square for which you have to sign up (under “Sections” in T-Square). **Deadline for this group enrollment is May 26!**

The following is a list of projects on which we will work in groups over two weeks, respectively. If your group completes the project you signed up for already in the first week, the group has to choose another project for the second week. You have to submit your results for each week, whether you are working on the same project or not.

Some of the cases in Gorman et al. are divided into sections (A,B,C, etc.). If not otherwise stated below, start always with A. The following sections focus on new problems or developments in the cases that require new lines of argumentation. Follow these developments as far as you like, or start with a new case after completing one.

- Problems in the development of breast implants (Chapters 4 to 5 in Gorman et al.)
- Car racing and the risk of engine failure (Chapters 6 to 8 in Gorman et al.)
- Environmental sustainability (Chapter 9 in Gorman et al.)
- Life cycle assessment and environmentally sustainable product design (Chapter 11 in Gorman et al.)
- Environmentally safe textile design (Chapter 13 in Gorman et al.; you might use also chapter 12)
- Minimizing waste in textile production (Chapters 14 to 18 in Gorman et al.; you might use also chapter 12)
- Food production: Sustainable development of financial, social, and environmental assets (Chapters 19 to 22 in Gorman et al.; focus on chapter 21)
- The Natural Step (TNS): A cyclical model of resource preservation (Chapter 23 in Gorman et al.)
- Biopiracy? Patenting a natural pesticide that has been used in India for thousands of years (Chapter 24 to 25 in Gorman et al.)
- How to electrify South Africa? Lessons from civil disobedience (Chapter 28 to 32 in Gorman et al.)
- Mapping out the advantages and disadvantages of various energy options for Ghana (Chapter 33 in Gorman et al.)
- 20 reasons why geoengineering the Earth’s climate may be a bad idea (Robock 2009)
- Given the tension between a global obligation to reduce the emission of greenhouse gases on one hand and regionally varying rights to development on the other, what is a fair distribution of rights and obligations? (Baer et al. 2008a or 2008b)

- Why arguments for tripling of global-nuclear-energy capacity on the grounds that nuclear fission is “carbon free” and “releases no greenhouse gases” are questionable (Shrader-Frechette 2009)
- Nanotechnology in Global Medicine and Human Biosecurity (Faunce 2007)
- Nanotechnology: The Challenge of Regulating Known Unknowns (Wilson 2006)
- Skeptical arguments for using biotechnology to pursue human perfection, both of body and of mind (Kass 2003)
- Sexual violence in cyberspace (Huff et al. 2003)
- Professional responsibility in software development (Gotterbarn 2001 or Gotterbarn & Rogerson 2005)
- Ethical Issues in Open Source Software (Grodzinsky et al. 2003)
- Can hacking be morally justified? (Himma 2006)

*Readings for projects, besides the textbook by Gorman, Mehalik, & Werhane (2000)*

- Baer, P., Athanasiou, T., Kartha, S., & Kemp-Benedict, E. (2008a). The Greenhouse Development Rights Framework: The right to development in a climate constrained world. Berlin: Heinrich Böll Foundation. Available online: <http://www.greenhousedevelopmentrights.org/GDRs>.
- Baer, P., Fieldman, G., Kartha, S., & Athanasiou, T. (2008b). Greenhouse Development Rights: Towards an equitable framework. *Cambridge Review of International Affairs*, 21, 649-669.
- Faunce, T. A. (2007). Nanotechnology in Global Medicine and Human Biosecurity: Private Interests, Policy Dilemmas, and the Calibration of Public Health Law. *Journal of Law, Medicine & Ethics*, Winter 2007, 629-642.
- Gotterbarn, D. (2001). Informatics and professional responsibility. *Science and Engineering Ethics*, 7(2), 221-230.
- Gotterbarn, D., & Rogerson, S. (2005). Responsible Risk Analysis for Software Development: Creating the Software Development Impact Statement. *Communications of the Association for Information Systems*, 15(40), 730-750.
- Grodzinsky, F., Miller, K., & Wolfe, M. (2003). Ethical Issues in Open Source Software. *Journal of Information, Communication and Ethics in Society*, 1(4), 193-205.
- Himma, K. (2006). Hacking as Politically Motivated Civil Disobedience: Is Hacktivism Morally Justified? In K. Himma (Ed.), *Readings in Internet Security: Hacking, Counterhacking, and Society*. Sudbury, MA: Jones and Bartlett.
- Huff, C., Johnson, D. G., & Miller, K. (2003). Virtual Harms and Real Responsibility. *IEEE Technology and Society Magazine*, 22(2), 12-19.
- Kass, L. R. (2003). Beyond Therapy: Biotechnology and the Pursuit of Human Improvement. Retrieved from <http://www.bioethics.gov/background/kasspaper.html>
- Robock, A. (2008). 20 reasons why geoengineering may be a bad idea. *Bulletin of the Atomic Scientists*, 64(2), 14-18, 59.
- Shrader-Frechette, K. (2009). Data Trimming, Nuclear Emissions, and Climate Change. *Science & Engineering Ethics*, 15(1), 19-23.
- Wilson, R. F. (2006). Nanotechnology: The Challenge of Regulating Known Unknowns. *Journal of Law, Medicine & Ethics*, Winter 2006, 704-713.

## Schedule

“I” means: “submit homework individually in T-Square before you come to class”;

“G” means: “group submission in T-Square after class. Put all your names on the map.”

<i>Week</i>	<i>Date</i>	<i>Theme</i>	<i>Reading</i>
1	May 12	<b>Introduction</b>	
	May 14	Logical Argument Mapping	LAM Manual
2	May 19	Absolutism; theological voluntarism; cultural relativism	
		Why professional ethics?	Harris chap. 1 (I)
	May 21	Group work and class presentations	Exercises (G)
3	May 26	Deontological ethics: Kant	
		Responsibility in Engineering	Harris chap. 2; Vaughan exc. 1 (I)
	May 28	Group work and class presentations	Economist (I,G)
4	Jun 2	<b>Test: LAM / Ethics and Emotions; intuitionism</b>	
		Framing the problem	Harris chap. 3; Vaughan exc. 1 (I)
	Jun 4	Group work	Project reading (I,G)
5	Jun 9	Utilitarian Ethics	
		Resolving problems	Harris chap. 4; Zim- bardo (I)
	Jun 11	Group work	Project reading (G)
6	Jun 16	Movie: The experiment (2001)	
		The social and value dimensions of technology	Harris chap. 5 (I)
	Jun 18	Group presentations	
7	Jun 23	Guest speaker: Engineers Without Borders	
		Trust and reliability	Harris chap. 6 (I)
	Jun 25	Group presentations	
8	Jun 30	Social Contract Ethics; justice	
		Risk and liability and Engineering	Harris chap. 7 (I)
	Jul 2	Group work	Project reading (I,G)
9	Jul 7	Virtue Ethics	
		Engineers in organizations	Harris chap. 8 (I)
	Jul 9	Group work	Project reading (G)

<i>Week</i>	<i>Date</i>	<i>Theme</i>	<i>Reading</i>
10	Jul 14	Social practices and virtues	
		Engineers and the environment	Harris chap. 9 (I)
	Jul 16	Group presentations	
11	Jul 21	Care Ethics	
		International engineering professionalism	Harris chap. 10 (I)
	July 23	Group presentations	
12		<b>Final</b>	

### Grading

<i>Task</i>	<i>Description</i>	<i>Max. points</i>
Homework on Harris et al.	10 homework assignments that you can find in T-Square under “Assignments.” Submit <b>10 minutes before class starts on Tuesday</b> in T-Square. The system will not accept late submissions! The purpose of these homework assignments is to intensify your own preparation for our class discussions. I will not evaluate what you send. But you have to write at least half a page of reasonable text. You will get for each of these assignments 4 points (if complete and reasonable). At the end, I will count only 8 out of 10 possible assignments; that gives you some flexibility.	32
Homework on projects	In order to prepare the work in groups, you have to submit individually a LAM map that represents the central argument, or a central position of the reading. Submit a pdf-file of your map in T-Square <b>10 minutes before class starts on Thursday</b> . No late submissions. No evaluation, but it must be complete and reasonable. 5 points for each.	15
Group work	You will work in small groups on 6 Thursdays. The first two are about exercises that we will discuss in class after your group work. The rest is in preparation of two group presentations: You can either work on one project over two weeks to prepare each presentation or, if you finish earlier, two projects. However, the results of each week’s work must be submitted by one group member in T-Square under “Assignments.” Put all your names on the map, export in cmap as pdf-file, and submit the pdf-file. Each submission will be 5 points for each group member without evaluation. I count 5 out of 6.	25
Group presentations	There will be 2 group presentations in front of other groups. Each group presents one project. We will evaluate the groups’ responsiveness to questions and objections, and whether each group member contributes equally. Maximum 5 points for each presentation.	10
Test	Covers Logical Argument Mapping. Test time: Jun 2, 4-4.30pm, in class.	6
Final	Covers the meta-ethical argumentation strategies (lecture) and the dimensions of professional ethics that you discussed in your homework. The final will	12

	take place at the time designated by the registrar, but you can do it where ever you want. Only submissions in T-Square are accepted, so make sure that you have internet access (e.g. via library computers).	
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*Check your points regularly to see whether the system works*

During the whole semester, you can see all your points in the “Gradebook” of “T-Square.” But give us a few days to put them into the system.

*Grading system*

At the end, all your points will be transformed in letter grades according to the following list:

A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

### **Academic Honor Code**

Based on GT’s Honor Advisory Council recommendation I would like to clarify the following points: You are allowed (and encouraged) to work together with other students on homework, as long as you write up and turn in your own solutions. Submitting any work other than your own is a violation of the Academic Honor Code. Quoting other authors, of course, is common scientific practice. However, you have to make absolutely clear what are your own formulations, and what those of others. You can quote the texts of our seminar in short form (e.g. “Vaughan, p. 52”). Other sources have to be listed under “References.” Plagiarism will be dealt with according to the GT Academic Honor Code. Note that plagiarizing is defined by Webster’s as “to steal and pass off (the ideas or words of another) as one’s own : use (another’s production) without crediting the source.” For any questions involving these or any other Academic Honor Code issues, please consult me or [www.honor.gatech.edu](http://www.honor.gatech.edu).

### **Contact**

Feel free to contact me if there are any problems you would like to discuss. My **office hours** are Thursday 3:00-4:00 pm or by appointment. The office is located in the basement of the DM Smith Building, room 004. My **phone number** is 404-385-6083. The easiest way to contact me is by **e-mail**: [m.hoffmann@gatech.edu](mailto:m.hoffmann@gatech.edu). (Be careful: two “n” at the end of my name!)