

PHIL 348 Ethics in Engineering
Detailed Course Outline
Michael McDuffie

Catalog Description

Survey of ethical issues commonly encountered by engineers. Explores professional ethics of engineering, roles and responsibilities of engineers, and social impact of engineering.

Student Learning Outcomes

After successfully completing this course, the student should be able to:

- Articulate general ethical issues often encountered by engineers and identify ethical issues when present in concrete cases of engineering practice.
- Explicate leading theories of ethics and basic ethical concepts like rights, justice, responsibility, and negligence.
- Outline and defend basic ethical and moral positions in speech and writing.

Required texts:

Harris, Pritchard, et al. *Engineering Ethics: Concepts and Cases*. 5th Edition. Wadsworth, 2013.

ISBN-13: 978-1133934684

ISBN-10: 1133934684

https://www.amazon.com/Engineering-Ethics-Jr-Charles-Harris/dp/1133934684/ref=dp_ob_title_bk

Robinson, Wade L. *Ethics Within Engineering*. Bloomsbury Academic, 2016.

ISBN-10: 1474286054

ISBN-13: 978-1474286053

https://www.amazon.com/Ethics-Within-Engineering-Wade-Robison/dp/1474286054/ref=mt_paperback?_encoding=UTF8&me

Various films and videos* (see below for list of potential selections)

Assignments

1. Weekly quizzes will reinforce reading of required texts and retention of key concepts. (25% of grade.)
2. Video discussion forums will offer students the opportunity to reflect on films/documentaries that raise ethical issues, through informal writing exercises. (Six on-line discussion forums, each requiring original response to

- prompt plus at least two replies to classmates; 25% of final grade, combined.)
3. Case study paper: 5-6 pages of formal writing, researching and commenting upon ethical issues in a historical case of engineering practice. (25% of final grade.)
 4. Midterm and Final Exams (25% of final grade, combined.)

Schedule

Weeks One and Two: Ethical Dimensions of Engineering

--Topics: Social impacts of engineering practice; ethics of design and invention; professional responsibilities of engineers.

--Readings: Harris, Chapter One; Robinson, Chapter One

Weeks Three and Four: Leading Theories of Ethics

--Topics: Utilitarianism; Kantian Deontological Ethics; Contractarian Ethics; Virtue Ethics; Ethics of Care; Practical Ethics Toolkit

--Readings: Harris, Chapter Two, plus excerpts from Mill, Kant, Aristotle, Rawls (available online via Cougar Courses)

Weeks Five through Seven: Responsibility in Engineering

--Topics: Engineering and design standards; responsibility for design flaws; accident analysis, causation, and blame-responsibility

--Readings: Harris, Chapter Three; Robinson, Chapters Two through Five.

Week Eight: The Social and Value Dimensions of Technology

--Topics: Social impacts of technology; technology as value-laden enterprise; technological optimism and pessimism

--Readings: Harris, Chapter Four.

Week Nine: Trust and Reliability

--Topics: Honesty; intellectual property; scientific and research integrity; conflicts of interest

--Readings: Harris, Chapter Five

Weeks Ten and Eleven: Risk and Liability

--Topics: Risk as product of probability and magnitude of harm; acceptable risk; scope of engineering liability; communication of risk

--Readings: Harris, Chapter Six; Robinson, Chapters Six and Seven

Weeks Twelve and Thirteen: Engineers in Organizations

--Topics: Organizational ethics; management vs. engineering roles and responsibilities; institutional disobedience; whistle-blowing

--Readings: Harris, Chapter Seven; Robinson, Chapters Eight and Nine

Week Fourteen: Engineers and the Environment

--Topics: Environmental impact; sustainability; green engineering; environmental stewardship and protection

--Readings: Harris, Chapter Eight

Week fifteen: Engineering in a Global Context

--Topics: Emerging global standards for engineering; economic underdevelopment and exploitation; ethical resources for global engineering

--Readings: Harris, Chapter Nine

***Potential Films list:**

Playing God (2012) on synthetic biology/bioengineering

The Day After Trinity (1981)

How Manhattan Escaped Tragedy (1996) (on the Citicorp building)

Modern Marvels: Engineering Disasters and Technology (various episodes)

Inventions that Changed the World (various episodes)

Broken Dreams: The Boeing 787 (2014)

Why Ships Sink (2012 PBS Nova episode)

Rosies of the North (1999) documentary on Canadian WWII era engineer Elsie MacGill

Dear Scientists (2014)

The Insider (1999)