NEW JERSEY INSTITUTE OF TECHNOLOGY
PHIL334: ENGINEERING ETHICS
Fall 2024

Instructor: Dr. Andrew Burnside
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Office: Cullimore Hall 435B
Office Hours: TF 10:05am-12:00pm

Class Meetings:

PHIL334-009	MW 8:30am – 9:50am	FMH 306
PHIL334-011	MW 1:00pm – 2:20pm	FMH 408
PHIL334-013	TF 8:30am – 9:50am	FMH 306/KUPF 205
PHIL334-015	TF 1:00pm – 2:20pm	FMH 408

Course Description:
PHIL334 is an introduction to thinking philosophically about the ethical dynamics of engineering. The course tackles two core topics:
(1) First, theoretical questions and two major ethical theories to aid decision-making in engineering.
(2) Second, we consider fundamental questions concerning the applied ethics of engineering:

- What ethical duties do engineers owe their communities, employers, and other engineers?
- When, if ever, do engineers have a responsibility to halt development?
- If fiduciary responsibility and another obligation come into conflict, which is prioritized?

Course Outcomes:
Course participants will take two conceptual tools away from the course:

- Critical engagement with practical, ethical questions which arise directly from careers in STEM and related domains of business consulting and/or management.
- Understanding of the practical relevance of case studies/problems in the history of engineering.

Course Texts:

Cahn, Steven M (editor). 2019. *Exploring Ethics: An Introductory Anthology*, 5th Edition. **(required)**

Johnson, Deborah G. 2020. *Engineering Ethics: Contemporary and Enduring Debates*. **(required)**

Petroski, Henry. 1985. *To Engineer is Human: The Role of Failure in Successful Design*. (optional)

(all other required course readings will be posted on Canvas as .pdf files)

Assignments and Evaluation*:

Short Reflection Papers	(3x5%) 15%
Mini Quiz	5%
Participation & Attendance	10%
Exam 1	25%
Exam 2	25%
Final Project/Portfolio	20%

Grading Scale*:

A	>=90	C	74-70
B+	89-85	D	69-60
B	84-80	F	<60
C+	79-75		

*on an absolute scale (i.e, no curve)

Accommodations and Disability:
Students with any accommodation needs and/or requests (e.g., accessible instructional texts and materials) are strongly encouraged to inform the instructor in a timely manner. Any accommodation requests in accordance with NJIT's accessibility policy and services should be submitted through proper institutional channels.

Grading Policies:

- *The course will adhere very strictly to assignment due dates.*
    - Makeup exams will *only* be administered in cases of documented conflicts.
    - There is no makeup for late reflection papers. Following an emergency, contact the instructor.

- Each course participant should engage often in discussions of the reading assignments and is expected to have read the material for the lecture of that day.
    - Students must engage in civil discussion of course material. Repeated failures to be respectful of others in discussions will result in a harsh deduction to the participation/attendance grade.

- There is an attendance policy (with two unexcused absences permitted) because participation (speaking, attentiveness, annotating the reading, etc.) is crucial to facilitate an engaging classroom environment.
    - Unexcused absences beyond the allotted two will drop the attendance grade in 5% increments.

- Course participants will write three 1-2 pp. reflection papers pertaining to a reading in each of Units I-III according to a simple rubric.
    - These reflections are due *before midnight* (*11:59am EDT/EST*) on the due date for the chosen topic/reading.

- There are two in-class exams (and a quiz) covering the course content for Units I-III. To receive a final grade, students *must* sit for all scheduled exams and quizzes.
    - A simple study guide will be provided in advance for both exams.

- A final project portfolio, based on a specific (historical or contemporary) case study of relevant interest, is due at the end of Unit IV. Students will:
    - (1) choose a specific issue in engineering *relevant to their major*, (2) develop a technical survey of the problem, (2) propose an original solution and methodology, and (3) offer justification for implementing their solution to a hypothetical stakeholder based on an ethical theory or principle.

Statement on Academic Integrity:
Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: NJIT Academic Integrity Code.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

Artificial Intelligence Policy:
This course expects students to work without artificial intelligence (AI) assistance in order to better develop their skills in this content area. As such, AI usage is not permitted throughout this course under any circumstance. Additionally, all suspected violations of this policy will be reported to the Dean of Students Office.

Technology Policy:
Students are not allowed to use handheld devices (e.g., smartphones) or access non-course-related material during class meetings. This is to ensure the ability for others to participate without distractions. In the case of an officially recognized accommodation through NJIT, please contact the instructor for an exception. In the case of a need for emergency phone use, please excuse yourself from the classroom. Violations of this policy may result in a participation/attendance grade deduction.

FULL COURSE SCHEDULE

Week/Date:	Lecture Topic:	Reading/Exam Schedule:
I: INTRODUCTORY ISSUES *Why Should I Care*?		
Week 1 Sep. 3-6	*What is an engineer*?	Petroski, *To Engineer is Human*, Ch. 1: "Being Human" 1-10; Ch. 4: "Engineering as Hypothesis" 40-50 Johnson, *Engineering Ethics*, Ch. 1: "Can Engineering Ethics Be Taught?" 9-25
Week 2 Sep. 9-13	Moral Dilemmas	Plato, *Euthyphro* (.pdf) Whitbeck, "Ethics as Design: Doing Justice to Moral Problems," *Hastings Center Report* 26, 9-16 (.pdf) Thomson, "The Trolley Problem" and "Turning the Trolley," *Exploring Ethics*, 421-423; 424-427
Week 3 Sep. 16-20	Codes of Ethics: Are Rules or Laws Enough? **REFLECTION I DUE (AT END OF WEEK)**	Johnson, *Engineering Ethics*, Ch. 2: "Do Engineers Need Codes of Ethics?" 26-45 The National Society of Professional Engineers (NSPE), *Code of Ethics for Engineers* (.pdf) Plato, *Crito*, *Exploring Ethics*, 6-21 King, "Letter from a Birmingham Jail" (.pdf) **MINI QUIZ**
II: THEORETICAL ETHICS What makes an action *right* or *wrong*?		
Week 4 Sep. 23-27	Utilitarianism: The Greatest Happiness Principle	Johnson, *Engineering Ethics*, Ch 3: "How Should Engineers Think About Ethics?" 53-58 Bentham, *Principles of Morals and Legislation* (excerpts) (.pdf) Mill, *Utilitarianism*, *Exploring Ethics*, 98-105
Week 5 Sep. 30-Oct. 4	Deontology: The Categorical Imperative	Johnson, *Engineering Ethics*, Ch 3: "How Should Engineers Think About Ethics?" 59-63 Kant, *Groundwork for the Metaphysics of Morals*, *Exploring Ethics*, 83-93
Week 6 Oct. 7-11	Critique of Theoretical Ethics **REFLECTION II DUE (FIRST CLASS OF WEEK)**	Pojman, "Strengths and Weaknesses of Utilitarianism," *Exploring Ethics*, 106-114 O'Neill, "A Simplified Account of Kant's Ethics," *Exploring Ethics*, 94-97 **EXAM 1 IN CLASS**

III: SOCIAL RESPONSIBILITIES AND OBLIGATIONS *To whom are engineers beholden?*		
Week 7 Oct. 14-18	Engineering as Social Activity: Social Responsibility	Johnson, *Engineering Ethics*, Ch 3: "How Should Engineers Think About Ethics?" 46-53
		Layton, *The Revolt of the Engineers: Social Responsibility and the American Engineering Profession*, "Preface" vii-xv (.pdf)
Week 8 Oct. 21-25	Social Justice and Engineering	Johnson, *Engineering Ethics*, Ch. 8: "Is Social Justice in the Scope of Engineers' Social Responsibilities?" 156-165 Karwat, "Engineering for the People: Putting Peace, Social Justice, and Environmental Protection at the Heart of All Engineering" in *Frontiers of Engineering*: 2018 Symposium Reports, 29-35 (.pdf)
		Johnson, *Engineering Ethics*, Ch. 8: "Is Social Justice in the Scope of Engineers' Social Responsibilities?" "165-176"
Week 9 Oct. 28-Nov. 1	Fiduciary Responsibility: Professionalism, Whistleblowing, and Corruption	Johnson, *Engineering Ethics*, Ch 4: "Should Engineers See Themselves as Guns for Hire?" 73-91
		Johnson, *Engineering Ethics*, Ch 5: "Are Whistleblowing Engineers Heroes or Traitors?" 93-114
Week 10 Nov. 4-8	Community Responsibility: Improving the World	Singer, "Famine, Affluence, and Morality," *Exploring Ethics*, 151-160 Petroski, *To Engineer is Human*, Ch. 6: "Design is Getting from Here to There" 65-74
		Johnson, "Rethinking the Social Responsibilities of Engineers as a Form of Accountability," *Philosophy and Engineering: Exploring Boundaries, Expanding Connections*, 85-98 (.pdf)
Week 11 Nov. 11-15	Environmental Responsibility: Crisis, Management, and Globalization **REFLECTION III DUE (AT START OF WEEK)**	Jamieson, "Ethics and Global Change," *Exploring Ethics*, 302-305 Johnson, *Engineering Ethics*, Ch. 6: "Are Rotten Apples or Rotten Barrels Responsible for Technological Mishaps?" 117-136
		EXAM 2 IN CLASS

IV: CONCLUSION *Case Studies and Application*		
Week 12 Nov. 18-22	Engineering Catastrophes: Bridges, Airplanes, Walkways, and… Molasses?	Petroski, *To Engineer is Human*, Ch. 9: "Safety in Numbers" 98-106 NSPE, Board of Ethical Review Cases (excerpts) (.pdf)
		Peterson, *Ethics for Engineers*, Case Studies (excerpts) (.pdf)
Week 13 Nov. 25-29	Engineering Catastrophes: Bias, Technology, and Society	Noble, *Algorithms of Oppression*, Ch. 6: "The Future of Information Culture" 153-169 (.pdf)
		Liao, Huebner, "Oppressive Things," *Philosophy and Phenomenological Research* 103 (1), 92-113 (.pdf)
THANKSGIVING BREAK		
Week 14 Dec. 2-6	Emerging Technologies: Artificial Intelligence, Autonomous Cars	Johnson, *Engineering Ethics*, Ch. 7: "Will Autonomous Cars Ever Be Safe Enough?" 137-155 Gabriel, et al. (Google DeepMind), "The Ethics of Advanced AI Assistants," Section 7: "Safety" (.pdf)
		Bender, et al., "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?" (.pdf)
Week 15 Dec. 9-11	*What is an engineer*? Failure and Bouncing Back ***FINAL PROJECT DUE***	Johnson, *Engineering Ethics*, "Conclusion" 177-179
		Petroski, *To Engineer is Human*, Ch. 17: "The Limits of Design;" "Afterword" 216-232