

NEW JERSEY INSTITUTE OF TECHNOLOGY  
 PHIL334: ENGINEERING ETHICS  
 Spring 2025

Instructor: Dr. Andrew Burnside  
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Office: Cullimore Hall 435B  
 Office Hours: TR 1:30pm – 3:30pm

Class Meetings:

PHIL334-002	TR 11:30am – 12:50pm	FMH 108
PHIL334-004	TR 4:00pm – 5:20pm	FMH 407
PHIL334-006	WF 10:00am – 11:20am	FMH 407
PHIL334-008	WF 1:00pm – 2:20pm	FMH 108

Course Description:

PHIL334: *Engineering Ethics and Technological Practice: Philosophical Perspectives on Engineering* 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 professional 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. (req.)
- Johnson, Deborah G. 2020. *Engineering Ethics: Contemporary and Enduring Debates*. (req., library access)
- Petroski, Henry. 1985. *To Engineer is Human: The Role of Failure in Successful Design*. (opt.)

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

Assignments and Evaluation\*:

Short Reflection Papers	(3x5%) 15%
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 (starting Week 3, two unexcused absences permitted) because participation (speaking, attentiveness, following in 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.
  - **All excused absences must be accompanied by the Dean of Students Office approval.**
- 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 respective unit.
- There are two full length, in-class exams and one short quiz covering the course content for Units I-III. To receive a final grade, students *must* sit for both scheduled exams.
  - Study guides will be provided in advance for both exams.
- A final project/portfolio, based on a specific (historical or contemporary) case study of relevant interest for engineering, 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](mailto:dos@njit.edu).

## Artificial Intelligence Policy:

This course pilots the use of the premium subscription of Grammarly for Education at NJIT. Students will be encouraged to use all aspects of Grammarly's Generative AI to improve the writing process of their papers. **Students are required to use Grammarly Authorship and share their report for each of their submissions (reflection papers, final project) to demonstrate all work as their own.** Use of other AI tools is prohibited.

## 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:
<b>I: INTRODUCTORY ISSUES</b> <i>Why Should I Care?</i>		
Week 1  Jan. 21-24	<i>What is an engineer?</i>	<p>Petroski, <i>To Engineer is Human</i>, Ch. 1: "Being Human" 1-10; Ch. 4: "Engineering as Hypothesis" 40-50</p> <p>Johnson, <i>Engineering Ethics</i>, Ch. 1: "Can Engineering Ethics Be Taught?" 9-25</p>
Week 2  Jan. 27-31	Moral Dilemmas	<p>Plato, <i>Euthyphro</i> (.pdf)</p> <p>Whitbeck, "Ethics as Design: Doing Justice to Moral Problems," <i>Hastings Center Report</i> 26, 9-16 (.pdf)</p> <p>Thomson, "The Trolley Problem" and "Turning the Trolley," <i>Exploring Ethics</i>, 421-423; 424-427</p>
Week 3  Feb. 3-7 (attendance begins)	Codes of Ethics: Are Rules or Laws Enough?	<p>Johnson, <i>Engineering Ethics</i>, Ch. 2: "Do Engineers Need Codes of Ethics?" 26-45</p> <p>The National Society of Professional Engineers (NSPE), <i>Code of Ethics for Engineers</i> (.pdf)</p> <p>Plato, <i>Crito</i>, <i>Exploring Ethics</i>, 6-21</p> <p>King, "Letter from a Birmingham Jail" (.pdf)</p> <p><b>QUIZ 1 IN CLASS</b></p>
<b>II: THEORETICAL ETHICS</b> <i>What makes an action right or wrong?</i>		
Week 4  Feb. 10-14	Utilitarianism: The Greatest Happiness Principle  <b>REFLECTION I DUE (END OF WEEK)</b>	<p>Johnson, <i>Engineering Ethics</i>, Ch 3: "How Should Engineers Think About Ethics?" 53-58</p> <p>Bentham, <i>Principles of Morals and Legislation</i> (excerpts) (.pdf)</p> <p>Mill, <i>Utilitarianism</i>, <i>Exploring Ethics</i>, 98-105</p>
Week 5  Feb. 17-21	Deontology: The Categorical Imperative	<p>Johnson, <i>Engineering Ethics</i>, Ch 3: "How Should Engineers Think About Ethics?" 59-63</p> <p>Kant, <i>Groundwork for the Metaphysics of Morals</i>, <i>Exploring Ethics</i>, 83-93</p>
Week 6  Feb. 24-28	Critique of Theoretical Ethics	<p>Pojman, "Strengths and Weaknesses of Utilitarianism," <i>Exploring Ethics</i>, 106-114</p> <p>O'Neill, "A Simplified Account of Kant's Ethics," <i>Exploring Ethics</i>, 94-97</p> <p><b>EXAM 1 IN CLASS</b></p>

III: PROFESSIONAL ETHICS  
Social Responsibilities and Obligations

<p>Week 7 Mar. 3-7</p>	<p>Engineering as Social Activity: Social Responsibility</p>	<p>Johnson, <i>Engineering Ethics</i>, Ch 3: "How Should Engineers Think About Ethics?" 46-53</p> <p>Layton, <i>The Revolt of the Engineers: Social Responsibility and the American Engineering Profession</i>, "Preface" vii-xv (.pdf)</p>
<p>Week 8 Mar. 10-14</p>	<p>Social Justice and Engineering <b>REFLECTION II DUE (END OF WEEK)</b></p>	<p>Johnson, <i>Engineering Ethics</i>, Ch. 8: "Is Social Justice in the Scope of Engineers' Social Responsibilities?" 156-165</p> <p>Karwat, "Engineering for the People: Putting Peace, Social Justice, and Environmental Protection at the Heart of All Engineering" in <i>Frontiers of Engineering: 2018 Symposium Reports</i>, 29-35 (.pdf)</p> <p>Johnson, <i>Engineering Ethics</i>, Ch. 8: "Is Social Justice in the Scope of Engineers' Social Responsibilities?" 165-176</p>
<p>Week 9 Mar. 17-21</p>		<p style="text-align: center;">SPRING BREAK – NO CLASS</p>
<p>Week 10 Mar. 24-28</p>	<p>Fiduciary Responsibility: Professionalism, Whistleblowing, and Corruption</p>	<p>Johnson, <i>Engineering Ethics</i>, Ch 4: "Should Engineers See Themselves as Guns for Hire?" 73-91</p> <p>Johnson, <i>Engineering Ethics</i>, Ch 5: "Are Whistleblowing Engineers Heroes or Traitors?" 93-114</p>
<p>Week 11 Mar. 31-Apr. 4 (no class Apr. 3)</p>	<p>Community Responsibility: Improving the World</p>	<p>Singer, "Famine, Affluence, and Morality," <i>Exploring Ethics</i>, 151-160</p> <p>Petroski, <i>To Engineer is Human</i>, Ch. 6: "Design is Getting from Here to There" 65-74</p> <p>Johnson, "Rethinking the Social Responsibilities of Engineers as a Form of Accountability," <i>Philosophy and Engineering: Exploring Boundaries, Expanding Connections</i>, 85-98 (.pdf)</p>
<p>Week 12 Apr. 7-11</p>	<p>Environmental Responsibility: Crisis, Management, and Globalization</p>	<p>Jamieson, "Ethics and Global Change," <i>Exploring Ethics</i>, 302-305</p> <p>Johnson, <i>Engineering Ethics</i>, Ch. 6: "Are Rotten Apples or Rotten Barrels Responsible for Technological Mishaps?" 117-136</p> <p style="text-align: center;"><b><u>EXAM 2 IN CLASS</u></b></p>

## IV: CONCLUSION

### Case Studies

Week 13 Apr. 14-18 (no class Apr. 18)	Engineering Catastrophes: Bridges, Airplanes, Walkways, and... Molasses?	Petroski, <i>To Engineer is Human</i> , Ch. 9: "Safety in Numbers" 98-106 NSPE, Board of Ethical Review Cases (excerpts) (.pdf)
		Peterson, <i>Ethics for Engineers</i> , Ch. 10: "Risk and Uncertainty" (.pdf)
		Noble, <i>Algorithms of Oppression</i> , Ch. 6: "The Future of Information Culture" 153-169 (.pdf)
		Final Project Discussion (no reading)
Week 15 Apr. 28-May 2	Emerging Technologies: Artificial Intelligence, Autonomous Cars	Johnson, <i>Engineering Ethics</i> , 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)
Week 16 May 5-7	<i>What is an engineer?</i> Failure and Bouncing Back <b>FINAL PROJECT DUE (FINALS WEEK)</b>	Johnson, <i>Engineering Ethics</i> , "Conclusion" 177-179 Petroski, <i>To Engineer is Human</i> , Ch. 17: "The Limits of Design;" "Afterword" 216-232