

The final research paper is the compositional apex of the course. This project will enable you to study in depth a specific topic in engineering ethics of your own choosing.

Important Dates

The following milestones will help you start early and make continual progress in your work:

[1] Research Topic	October 9
[2] Working Bibliography	October 16
[3] Plan and Outline	October 23
[4] Complete Draft	November 6
[5] Peer Review	November 13
[6] Final Version	November 20

Each stage of your research project will be evaluated, checked, and counted, but only the final version of your project will be graded.

From Topic and Research Question to Thesis and Supporting Arguments

You are free to explore any topic of moral inquiry that is integrally related to the course, encompassing the *full scope of engineering practice* (from pencils and paper clips to the farthest reaches of astronomical exploration) and the *entire spectrum of philosophical reflection* (from the epistemological and metaphysical grounding of moral theory to the social and political concerns of applied ethics). First, find a research topic in which you are genuinely interested, and focus on a specific question that will guide your work. Below are some *example subjects* that may serve as a catalyst for you, but *find your own topic* and develop your own research question. After delimiting the focus of your project, begin to study your primary sources, formulating your thesis and developing your supporting argumentation. As you carry out these steps, read carefully and apply the principles outlined in Turabian, *A Manual for Writers*, 12–81.

Law and Professionalism in Engineering Practice

Should all engineers be licensed?

Why have unions been unsuccessful in enrolling engineers?

Do intellectual property laws and licensing requirements inhibit innovation in information technologies?

Moral Issues in Bioengineering and the Environment

Should we drill for oil on some of the last areas of protected land on our continent in order to meet current energy demands and facilitate economic stability?

What are the long-term implications of nuclear energy usage?

Should we develop genetically engineered foods?

What can be done to reduce global warming?

Technology and Society

- How can we establish security, safety, and privacy on the Internet?
- What are the fundamental ethical and moral issues involved in video games?
- Should large corporations transfer low skill jobs to developing countries whose labor costs are lower than in the United States?

Bibliography

Your bibliography should include key books and published journal articles related to your topic. Professional journals and university presses have the highest standards of research, scholarship, and editorial review. Consider your project as part of the ongoing discussion of your topic in the larger intellectual community. Evaluate all sources critically.

Format of the Research Paper

The text of your paper should be twelve pages or more in length, double-spaced, in 12-point type, with one-inch margins. All references should be structured in *Chicago Manual of Style* citation format, with *footnotes* and *bibliography*. See *A Manual for Writers*, 133–280.

Checklist for Review of Research Paper Draft

Thesis and Arguments

- Is the thesis statement clear?
- Are terms and concepts defined precisely?
- Are the arguments in support of the thesis sound?
- Is there sufficient factual evidence in support of the thesis?
- Have possible counter-arguments been considered and addressed?
- Do all arguments focus on the thesis?

Organization

- Is the structure of the paper evident?
- Are the transitions between sections and paragraphs well-crafted?
- Is each paragraph coherent with a central idea integrally related to your thesis?
- Does each sentence have a clear purpose with cohesion between sentences?

Style and Mechanics

- Do the sentences flow gracefully, with a variety of sentence structures?
- Are the grammar and syntax cohesive?
- Are words chosen carefully?
- Are there any superfluous words?
- Are the spelling and punctuation correct?
- Are references cited properly?

ECE/Philosophy 316 Final Research Paper

[1]

Thesis and Structure

Thesis Statement and Outline

- 3: Strong introduction, with a clear thesis statement and a well-crafted outline.
- 2: Thesis stated, with a basic outline to guide the reader.
- 1: Inadequate statement of thesis and outline.

Clarity and Organization

- 3: Overall organization is clear with appropriate transitions. Paragraph structure is integrally related to the thesis statement and outline. Paragraphs are coherent and ideas are clear. Conclusion is strong and summarizes key points.
- 2: Most paragraphs have a clear purpose. Topic sentences sometimes misplaced.
- 1: Lack of organizational structure interferes with the clarity of the paper.

[2]

Arguments, Counter-Arguments, Analysis, and Application

Arguments for Thesis

- 3: Provides persuasive arguments for the thesis statement. Uses appropriate teleological and deontological tools of moral analysis, line-drawing, analogies, and other principles of moral reasoning. Uses objective facts and specific examples. Evaluates all sources critically.
- 2: Offers strong arguments for the thesis statement with substantive justification
- 1: Inadequate argumentation in support of the thesis statement.

Counter-Arguments

- 3: Identifies and critically engages counter-arguments with understanding and precision. Exemplification of genuine dialogue. Sympathetic and rigorous discussion.
- 2: Identifies some of the important counter-arguments, listening to other viewpoints and responding with partial success.
- 1: Inadequate understanding of counter-arguments.

Moral and Contextual Analysis

- 3: Analyzes moral issues thoroughly from multiple perspectives. Makes careful moral distinctions. Thoroughly identifies and explains relevant factual and conceptual issues. Lists social and legal constraints. Understands the essential issues at stake.
- 2: Identifies some of the important moral issues and constraints
- 1: Inadequate moral and contextual analysis

Creativity, Insight, and Application

- 3: Demonstrates strong creativity and insight into fundamental issues, with specific application.
- 2: Creativity, insight, and application present, but need further development.
- 1: Inadequate grasp of the issues, with insufficient application.

[3]
Grammar and Composition

Sentences and Diction

- 3: Graceful sentences with appropriate variety of structures. Words are chosen precisely. Writing is vigorous and engaging.
- 2: Occasionally awkward or vague. Active verbs are used, with few superfluous or poorly chosen words. Some pronouns without clear referents.
- 1: Several cumbersome and unclear sentences. Wordy, excessive nominalizations, weak verbs.

Mechanics and Grammar

- 3: No significant errors of spelling, grammar, punctuation, or usage.
- 2: Minor errors of mechanics and grammar.
- 1: Numerous errors in grammar and substandard usage.

Source Citation:

- 3: Accurate citation of sources, using *Chicago Manual of Style* citation format for all references, including footnotes and bibliography (as outlined in Turabian, *A Manual for Writers*).
- 2: Minor errors in the correct citation of sources.
- 1: Numerous errors in source citation.

Format:

- 3: Twelve pages minimum in length. Double-spaced, in 12-point type, with one-inch margins. Title page with name, submission date, and descriptive title. Complete draft submitted on time and included with final version.
- 2: Failure to meet one of the format criteria indicated above.
- 1: Failure to meet two or more of the format criteria.

30 Points Total for Research Paper

FINAL IN-CLASS PRESENTATION

10 Points Total

Outline and Summary of Research Project

(5 Minutes)

Content

- 3: Stated thesis clearly. Explained key supporting arguments and defended the thesis against legitimate counter-arguments. Probed the moral and ethical dimensions of the project.
- 2: A stronger statement and defense of the thesis, with careful attention to possible counter-arguments, would have significantly strengthened the presentation.
- 1: Thesis unclear. Inadequate grasp of the moral issues at stake.

Delivery

- 2: Spoke clearly and fluently. Worked effectively within time limitations.
- 1: Failed to meet time requirements. Speaking was at times awkward or unclear.

Communication Tools

- 2: Integrated content and delivery with appropriate communication tools. Used power-point, well-crafted handouts, or chalkboard with skill and effectiveness. Demonstrated innovation and creativity in presentation.
- 1: Inadequate use and preparation of communication tools.

Response to Questions and Comments from Members of the Class

(4 Minutes)

Dialogue and Response

- 3: Listened to questions and comments from the class with understanding — and responded with clarity and grace. An awareness of the ethical complexities involved.
- 2: At points, did not fully understand the questions that were posed. Response revealed only a partial grasp of the ethical issues at state.
- 1: Inadequate dialogue with the class.