

EE 495 Ethics in Electrical Engineering

Credits: 1

Categorization of credits: other

Instructors or course coordinator: V. Lubecke, V. Malhotra, Z.Q. Yun, and A. Ohta; E-focus coordinator: W. Shiroma

Textbook and Other Required Materials: Martin M.W., Schinzinger R., *Ethics in Engineering*, 4th Ed., McGraw-Hill, NY, 2005 (or equivalent).

Designation: Required

Catalog Description: Equip electrical engineers with the necessary background for ethical reasoning, as it pertains to technology, society, workplace issues, and the environment. EE majors only. A-F only. Pre: senior standing or consent.

Pre- and Co-requisites: Pre-requisites: senior standing or consent.

Class/Lab Schedule: one 1-hour lecture per week.

Topics Covered:

This course has a Contemporary Ethical Issues (E) Focus designation. Contemporary ethical issues are fully integrated into the main course material and will constitute at least 30% of the content. At least 8 hours of class time will be spent discussing ethical issues. Through the use of lectures, discussions and assignments, students will develop basic competency in recognizing and analyzing ethical issues; responsibly deliberating on ethical issues; and making ethically determined judgments.

Electrical engineering has had a tremendous and direct impact on modern society in a variety of different areas, such as consumer electronics, electronics media, communications, electronic surveillance, etc. It has become increasingly important that for new technological developments ethical considerations are carefully studied and options are explored that better suit the needs of the society. The aim of this class, which is completely devoted to ethics, is to equip electrical engineers with the necessary background for ethical reasoning, as it pertains to technology, the society, workplace issues, and the environment. Approximately one half the classroom time will be devoted to discussion – since this is a one-credit class, a total of around 8 hours of class time will be used for discussion. The remaining time will be devoted to conventional lecturing about ethics.

The following topics will be covered (The chapters refer to the textbook)

- Professionalism (Ch. 1)
- Moral reasoning (Ch. 2), moral framework (Ch. 3) and moral leadership (Ch.10).
- Electrical engineering and the society: how has electrical engineering affected modern society?
- Were there any ethical dilemmas? How will electrical engineering affect the future of society, and what ethical dilemmas do this raise? (Ch. 4)
- Safety and risk: When does electrical engineering affect safety? How to balance safety and economics (Ch. 5).

- Workplace responsibilities and rights (Ch. 6)
- Ethics in a digital world: copyright and the law: Overview of current copyright and IP laws. The ethical balance between protecting IP (the individual creator) and the advancement of society. (Material from the internet (non-copyrighted!) and Lawrence Lessig: The Future of Ideas: The Fate of the Commons in a Connected World, Vintage 2002).
- Global issues (Ch. 10): multinational corporations, weapons development. The topics will be studied through case studies, with an emphasis on case studies relevant to electrical engineering.

Course Objectives and Relationship to Program Objectives:

Equip electrical engineers with the necessary background for ethical reasoning, as it pertains to technology, society, workplace issues, and the environment. [This course is related to Program Objective 5.]

Course Outcomes and Their Relationship to Program Outcomes

The following are the course outcomes. The Program Outcomes (numbered 1-7) that they address are in square braces (“[]”).

- Understand professionalism in electrical engineering. [4]
- Understand and exercise moral reasoning, moral framework and moral leadership. [4]
- Understand that electrical engineering can affect modern society with possible ethical dilemma. [4]
- Know how to balance safety and economics. [2, 4]
- Know workplace responsibilities and rights. [4]
- Understand ethics in a digital world: copyright and intellectual property rights. [4]
- Know global ethical issues. [4]
- Have tools for responsible deliberation and ethical judgment. [2, 4]
- Achieve basic competency in analyzing and deliberating upon contemporary ethical issues to help make ethically determined judgments. [4]

Contribution of Course to Meeting the Professional Component

Ethics: 100%

Computer Usage: Some

All course related materials are provided on-line through Laulima. It is expected that students will use internet to search for materials related to HW assignments, such as for example ethics codes, and USPTO database.

Design Credits and Features: None

Person(s) Preparing Syllabus and Date: G. Sasaki, June 5, 2009. Revised by Olga Boric-Lubecke, Sept. 30, 2014; W. Shiroma, Jan. 21, 2021.