

## EE 403W – Senior Project Design

**Designation:** Required course (or replaced by EE 402W) for electrical engineering majors.

**University Bulletin Description:** (3) Project designs of electrical engineering systems, encompassing various subdisciplines within Electrical Engineering, with an emphasis on technical communications skills. Prerequisites: EE 330, EE 350, EE 316, and the completion of two Electrical Engineering technical electives. Prerequisite or Concurrent: ENGL 202C.

### Prerequisites by Topics:

1. Competency in all core EE “C or better” courses, including EE 210, EE 310, EE 316, EE 330, EE 350, and CSE 271;
2. Competency in at least two EE technical electives;
3. An ability to write clearly, and an understanding of the fundamentals of technical writing;
4. Public speaking ability and the ability to describe technical concepts orally.

### Textbook/Required Materials:

1. *Writing as an Engineer*, 2<sup>nd</sup> edition, Beer and McMurrey, Wiley, ISBN 0-471-43074-9, 2004;
2. *Design for Electrical and Computer Engineers: Theory, Concepts, and Practice*, Ford and Coulston, McGraw-Hill, ISBN 0-07-319599-5, 2005 (required for industrial projects sections only);
3. *The Art of Electronics*, 2<sup>nd</sup> edition, Horowitz and Hill, Cambridge University Press, ISBN 0-521-37095-7, 1989 (optional);
4. Laboratory notebook, bound, quad-ruled pages, numbered duplicate tear-out pages.

### Learning Outcomes:

Upon completion of this course, students should be able to:

1. Complete a capstone design project that may be interdisciplinary in nature, integrating the knowledge obtained in previous EE classes;
2. Accurately communicate project results in writing;
3. Understand how teams work and how to interact in a team setting;
4. Understand budgets, schedules, and deadlines;
5. Effectively participate in design reviews;
6. Understand what it is like to work in industry;
7. Appreciate the role of engineering in society and the complexity of ethical issues.

### Topics:

1. Technical writing (2 classes)
2. Proposal writing (1 class)
3. The engineering design process (1 class)
4. System design (1 class)
5. Project management (1 class)
6. The design review process (2 classes)
7. Technical topics (2 classes)
8. Project documentation (1 class)
9. Lifelong learning (1 class)
10. Professional seminar topics (10 classes)

**Class/Laboratory Schedule:** Two 50-minute lectures and one 3-hour laboratory per week.

**Computer Usage:**

The use of a computer in providing a technical solution varies by project. Many teams choose to incorporate a microcontroller into their design project. All teams use application software to prepare written reports and to create presentations.

**Laboratory Projects/Assignments:**

1. Laboratory project work (11 lab sessions)
2. Design review presentations (3 lab sessions)
3. Project showcase (industrial projects section only)

**Contribution to Meeting the Requirements of Criterion 5. Curriculum:**

This course contributes to both the engineering topics and design components.

This course provides a major design experience that allows students to apply knowledge gained in previous EE courses. In addition it provides exposure to topics that include ethics, professionalism, the engineering design process, global engineering, lifelong learning, and other “life as an engineer” topics.

**Relationship to Program Outcomes:**

- O.1.1. Graduates will possess mathematics skills necessary for electrical engineering.
- O.1.3. Graduates will have attained computer proficiency.
- O.2.1. Graduates will understand how to analyze and design simple electrical/electronic circuits.
- O.2.2. Graduates will understand electronic devices.
- O.2.3. Graduates will understand the basic concepts of linear systems and how they interact with continuous-time signals.
- O.2.5. Graduates will have knowledge of digital systems.
- O.3.1. Graduates will have in-depth technical knowledge in one or more areas of specialization.
- O.3.2. Graduates will have practical understanding of the major electrical engineering concepts and demonstrate application of their theoretical knowledge of the concepts.
- O.4.1. Graduates will interact with industry both within and outside of a classroom setting.
- O.4.2. Graduates will develop an appreciation of continuing educational and professional development.
- O.5.1. Graduates will have good teamwork skills.
- O.5.2. Graduates will possess good oral and written communication skills.
- O.6. Graduates will appreciate their role as engineers in society.

**Prepared by:** Mark J. Wharton

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