

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Writing across the Curriculum

May 2013

Degree Program Objectives

The objectives of the ECE department are published in the catalog and on the department web site. They state:

The ECE program objectives are designed to prepare students for successful careers in Engineering, related professional disciplines, or the successful pursuit of graduate studies with contributions to the betterment of society and the global community as evidenced by:

- Meaningful employment in industry, business, or government
- Leadership positions in their profession or communities
- Advanced degrees
- Promotions, awards, and recognitions within their chosen profession and discipline
- Positive contributions to their profession and to society
- Overall satisfaction with their undergraduate engineering preparation

The ECE writing across the curriculum plan, as an integral part of the curriculum, is designed to help students achieve these objectives

ECE Writing across the Curriculum Plan

I. Goals:

ECE students are required to write three types of documents, research papers, laboratory experiment reports, and project reports.

Lab reports: most ECE courses include laboratory experiments in which students build and analyze circuits, collect measurement data, interpret the data, and draw conclusion. Lab report writing is an essential component of the student learning process. Reports are graded on technical content, soundness of arguments as well as writing quality.

Research papers: in a few ECE courses, including individual studies, and projects, students are tasked with researching a particular engineering topic and report their finding in the form of a research paper. The paper is graded for content as well as organization and structure. In some cases, students are required to use a writing template specific to engineering such as the IEEE conference/journal paper templates.

Project reports: ECE students engage in class projects that requires submission of reports detailing their project work, methods, and results. Typically the quality of the written report is a substantial part of the assessment.

In all of their writings, besides good general writing skills, students must learn to integrate various commonly used engineering visual aids in their documents.

These include correctly labeled graphs, figures, tables, diagrams, and schematics that support their narrative and clarify the arguments presented in the document.

Document formatting, organization, and structure must be conducive to efficient expression of the informational content of the document.

II. Objectives

ECE student will achieve the goals stated above progressively through their studies. In the freshman year, they are required to take ECE 101-Introduction to Engineering, where they will be presented with standards of writing common in engineering: laboratory reports, general research papers and essays, and project reports.

In the sophomore/junior years, three courses have been selected that allow students to learn through writing. They learn to express engineering concepts using the language of mathematics. They also learn to integrate various technical visual aids into their narrative in describing their engineering work.

Finally, their writing experience culminates in the delivery of a substantial report providing the description of their own engineering design experience in the ECE year-long capstone design course. This document is written progressively as the project evolves and undergoes several iterations with the faculty project supervisor and the industry sponsor is any.

III. Courses

The five required courses identified for the Writing-Across-the-Curriculum requirement for ECE students are listed here in the three categories of introductory writing, intermediate writing-to-learn, and advanced writing.

Introductory Writing Course

ECE 101 – Introduction to Engineering.

This course prepares students at the freshman level for the engineering discipline in general. Writing is a substantial part of the course content. Students learn about various engineering concepts as well as professional skills required for an engineering career. The course covers writing techniques for lab reports, research papers, and essays. Students are introduced to the use of formatting templates commonly required by engineering publications venues and organization like the IEEE (Institute of Electrical and Electronics Engineers).

Intermediate Writing-to-Learn Courses

ECE 233 – Signals & Systems

ECE students learn fundamental principles and components of an electrical and computer engineering system. In writing, they learn to describe systems by developing lab reports with embedded engineering content including block diagrams, schematics, flowcharts, curves and graphs, and equations. They are required to write a minimum of eight graded lab reports.

MAT 249 – Engineering Mathematics

This course is designed to cover areas of mathematics of direct application to engineering problem solving. ECE students learn to use express solutions through the use of mathematical equations and derivations, related figures, diagrams and corresponding narratives.

ECE 401 – Senior Seminar

Students meet weekly in this seminar series to attend presentations or workshops given by invited speakers, faculty, or themselves. They are required to give a class presentation on a topic of close relevance to ECE. They are required to submit written papers or reports on various topics discussed in class.

Advanced Writing Course

ECE 491/ECE492 – Capstone experience

Every ECE student must design, develop, and demonstrate an Electrical & Computer Engineering device or process before graduating. Students are encouraged to work in multidisciplinary teams whenever possible and seek an industry sponsor for their project. This two-course series serves this purpose in an experience that requires writing an extensive report describing every aspect of the design.

In ECE 491 - Design proposal, students must write a proposal describing their chosen project, its planned specifications, and a plan for completing its development.

In ECE 492, - Capstone Project, students must write a substantial capstone project report describing all aspects of their project including its purpose, its design methods and components as well as its ethical, economic, environmental, and societal impact.

The above plan allows ECE students to progressively acquire writing skills that will serve them well in their engineering career and will help them achieve the program objectives listed at the beginning of this document.