Senior Design Projects (DP1/DP2) for ECE Students

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ABET (Accreditation Board for Engineering and Technology) requires that all students must be engaged in substantial engineering design before graduation. Engineering design is defined as a process of devising a system, component or process to meet desired needs and specifications within constraints. It is an iterative, creative, decision-making process in which the basic sciences, mathematics, and engineering sciences are applied to convert resources into solutions. Engineering design involves identifying opportunities, developing requirements, performing analysis and synthesis, generating multiple solutions, evaluating solutions against requirements, considering risks, and making trade-offs for the purpose of obtaining a high-quality solution under the given circumstances. Examples of possible constraints include accessibility, aesthetics, codes, constructability, cost, ergonomics, extensibility, functionality, interoperability, legal considerations, maintainability, manufacturability, marketability, policy regulations, schedule, standards, sustainability or usability.

To graduate in ECE all students must complete six (6) credits of Senior Design Project (DP1 and DP2). Normally, DP1 is taken in the fall of the senior year and DP2 is taken in the spring. However, there are many other possibilities. For example, DP1 can be one of the several courses designed to give students the background and lab practice to help in the design. DP1 can also be taken working one-on-one with a professor who agrees to do it. In certain cases, DP1 can be substituted by three credits of a VIP (Vertically Integrated Project).

In DP2, the students will design, build (or simulate), and test a device or system to meet prescribed engineering specifications. Design projects can be worked individually, in pairs, or larger groups. Together with a professor, students are encouraged to develop an idea for a project by the end of DP1, allowing ample time to fully develop the project in DP2 (ordering parts, learning required tools, etc.).

Seniors with a 3.0 GPA or higher may register for a two-semester Senior Thesis in place of the Design Project. A professor in the ECE department will need to agree to be your Thesis Advisor before you are able to register.

The courses listed in the tables below can be used as DP1. Most of them can also be used as ECE electives, which means that students are able to take more than one of them and decide later which class would be used as DP1. Classes that cannot be taken as an elective are noted below.

In most cases DP2 is arranged as an independent study class and does not have a traditional class schedule. DP2 students need to find a professor to oversee and grade their final project. This is not necessarily the same professor who taught the DP1 class. DP2 projects with a more traditional class schedule are noted below.

Electrical Engineering Design Project 1 Classes – **fall 2022** (3 credits)

Catalog #	Name	Prerequisites	Professor	Can be used as ECE elective	DP 2 class
ECE-UY 4123	**Electrical Power and Machinery**	ECE-UY 3824	Francisco De Leon	yes	ECE-UY 4223 (Ind. Study)
ECE-UY 4163	**Real-Time Digital Signal Processing**	ECE-UY 3054	Ivan Selesnick	yes	ECE-UY 4223 (Ind. Study)
ECE-UY 4173	**Telecommunication Networks**	ECE-UY 3613	Shivendra Panwar	yes	ECE-UY 4223 (Ind. Study)
ECE-UY 4183	**Wireless Communications**	ECE-UY 3054	Michael Knox	no	ECE-UY 4283
ECE-UY 4563	**Machine Learning**	ECE-UY 2233/ MA-UY 2224	TBD	yes	ECE-UY 4223 (Ind. Study)
ECE-UY 221	**DP1 Electrical and Computer Engineering**	With Permission	DP Advisor	no	ECE-UY 4223 (Ind. Study)

Computer Engineering Design Project 1 Classes – **fall 2022** (3 credits)

Catalog #	Name	Prerequisites	Professor	Can be used as ECE elective	DP2 class
ECE-UY 4313	**Computer Engineering Design Project**	Senior Status	Fraida Fund	yes	ECE-UY 4323
ECE-UY 4513	**Software Engineering**	CS-UY 3224 (co-requisite)	Fred Strauss	yes	CS-UY 4523

DP1/DP2 Reporting

ABET has a set of requirements that must be met by all design projects. The ECE majors page on Brightspace has a set of templates for project reports. Compulsory entries for all reports are:

- Introduction with a description of the importance of the topic
- Objectives and justification of the work including design constraints
- Analysis of Industry Standards
- Scopes and limitations
- Description of the most important issues solved
- Description on how the work was done, findings and their importance