**Senior Design Projects (DP1/DP2) for ECE Faculty**

Richard Toth, Francisco de Leon, Ivan Selesnick (January 2022)

ABET (Accreditation Board for Engineering and Technology) requires that all students must be engaged in substantial engineering design before graduation. Engineering design is defined by ABET 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 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 needs to agree to be your Thesis Advisor before you are able to register.

We hope that you, a faculty member of ECE, would help us taking some undergraduate students under your wing. Perhaps you can incorporate them into your research teams by taking a small part of the research that your PhD students or postdoctoral fellows are doing. DP1/DP2 is not research, but an engineering design project as defined by ABET. Attached there are some report templates that your students can follow.

Please send to Francisco and Richard Toth a few topic descriptions (short) appropriate for undergraduates. You can also mention the required qualifications (for example list pre-requisite courses). We will collect them and distribute then to our juniors and perhaps post them on a webpage.