Course Description
EE 4220 Senior Project I

2000-02 Catalog Data: Research and analysis leading to a preliminary design for an approved engineering project. Includes formal project proposal and work plan; specification of functional, performance and cost goals; generation of computer-aided design documents and simulation or modeling results. Design process is concluded in EE 4233 through prototyping, testing, and revisions. Prerequisite: EE 3384 with grade of “C” or better; for all options except computer engineering: EE 4210, EE 4210 may be taken concurrently with EE 4220. For computer engineering option: EE 4142 or EE 4178. EE 4142 or EE 4178 may be taken concurrently with EE 4220. Laboratory fee required.

Prerequisite by Topic: All required, basic EE lecture and laboratory courses are essential prerequisites to the Senior Project Sequence.

Course Outcomes: 1) Students shall have an understanding of the process required to design and develop an electrical or electronic product or instrument or a computer-based control system from concept and requirements to a fully documented, functional and packaged prototype (critical). 2) Students shall be able to effectively communicate through written reports, presentations and website and poster-session formats, and the important technical content in a design/development project including theory of operation and an account of the design/development process (critical). 3) Students shall understand and acknowledge the critical requirements for effective teamwork in team-based, long-term projects, including cooperation and communication in tasking, scheduling, integrating individual work and processing performance (critical).

Topics Covered: 1. Team dynamics (1–2 hours plus lab time)
2. Project scheduling and management (2-3 hours plus lab time)
3. Requirements-based design (1-2 hours plus lab time)
4. Technical proposals (1-2 hours plus lab time)
5. Oral presentations (3-5 hours)
6. Project evaluation/assessment (1-2 hours plus lab time)
Class Schedule: Two hours lecture, two to three hours lab per week.

Contribution to Professional Component:

Emphasis on written, oral and small-group communications as well as design and management techniques critical to a long-term group-based project.

Relationship to Program Outcomes:

2. Ability to design and conduct experiments and interpret data. Work of this type is common in simulations for initial design as well as in bench work to test, debug and characterize prototypes.
3. Ability to design a system, component or process to meet desired needs. This is the core of the two-course sequence.
4. Ability to function on multidisciplinary teams. Division of work between teammates based on areas of preference or expertise (e.g. software, analog hardware, digital hardware, digital signal processing, etc.) and the necessary integration stage helps build skills in this area.
7. Ability to communicate effectively. Stressed explicitly in written reports, presentations, poster session, small–group meetings.
9. Recognition of the need for and an ability to engage in life-long learning. Work of this type makes it clear to the students that they have acquired a good foundation and “learned the language,” but that sophisticated projects imply learning new methods and techniques.

Course Outcomes do not necessarily relate strongly to Program Outcomes 5, 6, 8, and 10. They correlate closely with Educational Objectives 1, 2, and 3 and the course is divided about equally between material related to each of these three objectives.

Computer Usage:

Internet research
Project management tools (e.g. Microsoft Project)
C.A.D. tools
Presentation tools (e.g. Powerpoint)

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