

EE 451 – Senior Capstone Project I-3 Hours
Required course

1. *2007-2008 Catalog description*
First of two courses devoted to the Senior Design Project. The primary goal of this course is to have the student (and partner) choose a senior project and use a top-down design approach prior to implementation in senior lab. In addition, the student will serve on a Design Review Team (DRT) that will analyze other senior projects. Prerequisite: Credit in EE 301, 302, 303, 304, 331, 332, 365, and 381 with a grade of C or better in six of the courses; credit or concurrent enrollment in EE 450 and two EE or technical electives.
2. *Prerequisites by topics*
Material taught in EE 301, EE 302, EE 303, EE 304, EE 331, EE 332, and EE 365
3. *Textbook (s) and/or other required material*
None
4. *Class Schedule:* Two lecture sessions per week, each 50 minutes, for 14 weeks: and one 6 hour lab session per week for 7 weeks
5. *Topics Covered (Outcomes influenced)*
 - Structure and overview of capstone senior project (7a)
 - Grading Policy and ECE Code of Conduct (7i)
 - Project ideas proposed by members of the ECE faculty (7a)
 - Web site authoring for the senior capstone project deliverables (7b)
 - Top-down design approach to the senior capstone project including functional description, detailed block diagram, functional requirements and a list of quantitative performance specifications 7(c,d)
 - Function of Design Review Teams for review and critique of the deliverables for other senior capstone projects (7c,d,e,h)
 - Library research techniques including patent searches (guest lecture) (7f,h)
 - Engineering and safety standards (guest lecture) (7f,h)
 - Experimental, analytical, software development, computer simulation and research on the senior capstone project as directed by the faculty advisor. (7c,d,f,g,h,i)
6. *Contribution of course to meeting the professional components*
Engineering Design - 100%
7. *Course Outcomes (Program Outcome contributions): In learning the course topics, the student will attain the following outcomes*
 - a. The student will choose a senior capstone project for implementation in senior lab (9C)
 - b. The student will establish a web site for the senior capstone project deliverables (9F)
 - c. The student will develop a detailed functional description, a detailed block diagram and description of operation of the senior capstone project (9A,B,C,D,F)
 - d. The student will determine the functional requirements of the senior capstone project and list its quantitative performance specifications (9A,B,C,D,F)
 - e. The student will serve on a Design Review Team (DRT) that will analyze the deliverables for other senior capstone projects (9A,B,C,D,F,G)
 - f. The student will identify and evaluate the patents, references and standards applicable to the senior capstone project (9A,B,C,D,F)
 - g. The student will perform productive experimental, analytical, software development, computer simulation and research work on the proposed senior capstone project and document work in a laboratory notebook (9A,B,C,D,F)
 - h. The student will prepare a written project proposal for next semester's work on the senior capstone project and defend it in an oral presentation to faculty and DRT members (9A,B,C,D,F)
 - i. The student will follow the ECE Code of Conduct and interact appropriately with his/her lab partner and classmates (9G)

8. *Grading policy and criteria* The grade in EE 451 will be based on the following components:

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| 1. Functional description and complete system/block diagram | 20% |
| 2. Functional requirements list with performance specifications | 15% |
| 3. Standards, patent search, bibliography | 5% |
| 4. Design Review Team appraisals | 15% |
| 5. Weekly evaluation of laboratory notebook | 10% |
| 6. Oral presentation on senior project proposal | 15% |
| 7. Project web site including all EE 451 deliverables,
weekly planning and progress reports, and the project proposal | 20% |

Using these weightings and assigned numerical grades (between 0 and 4), an overall Course GPA (CGPA) will be computed from which your letter grade will be determined as follows.

$3.5 \leq \text{CGPA} \leq 4.0$	A
$2.5 \leq \text{CGPA} < 3.5$	B
$1.5 \leq \text{CGPA} < 2.5$	C
$0.5 \leq \text{CGPA} < 1.5$	D
$\text{CGPA} < 0.5$	F

A 0 to 4 grade for items 1,2,3,5 and 7 will be assigned by the project advisors. The grades will be transmitted to the EE 451 instructor by supplied grade sheets via email.

Each Design Review Team will generate written appraisals for several different senior projects assigned to the team. Each Design Review Team will evaluate the functional description and the complete system/block diagram document, and functional requirements list with performance specifications. Grade item 4, the DRT appraisals, will be graded by the EE 451 instructor on a 0 to 4 basis.

The grade for item 6, the oral presentation, will be the average of the grades (0 to 4) assigned by the project advisors and two additional faculty members. The quality of the presentation will have an impact on the grade and will be an individual grade.

A grade of C corresponds to meeting the minimum competency required to understand course topics and meet course objectives.

Warning: Cheating will be dealt with as described in the *Academic Handbook*. The ECE Faculty has established the ECE Student Code of Conduct based on well known requirements of academic integrity as well as the ethical and professional conduct expected of an engineer. The ECE student code is posted on Blackboard.

9. *Relationship of course to program outcomes*

label	Program Outcomes (A Graduate from the program will:)	Contribution
A	have knowledge of the mathematical and scientific foundation of electrical engineering	Strong
B	have knowledge of and the ability to apply techniques and technology of electrical engineering	Strong
C	complete a design project sequence, culminating in a capstone project at or near the professional level	Strong
D	understand that acquisition of new knowledge is needed for success in the electrical engineering profession	Strong
E	meet Bradley's general education requirements which are based on the principles of liberal education	NA
F	have experience in communicating technical information and working on teams	Strong
G	understand the importance of professional and ethical behavior	Strong

10. *Prepared by:* Winfred N. Anakwa, May 21, 2008