

ELEN 493
ELECTRICAL ENGINEERING SENIOR DESIGN I

2002 - 2004 Catalog Data: ELEN 493 Electrical Engineering Senior Design I (Credit, 2 Hours). Topics covered include contemporary design steps and methodology relating to electrical engineering systems and subsystems. Designs and specifications are developed for at least two design projects. One of these projects will be chosen for the further development and implementation in EE494. Prerequisite: Senior standing and approval by the instructor and the department chair.

Textbook: None

References:

1. McConnell, Robert L., Cooley, Wils, and Nigel Middleton *Electrical Engineering Design Compendium*,.
2. Carroll and Fink, *Electrical Engineering Handbook*.
3. *National Electrical Code 1999*
4. Joseph Shigley and Charles Mischke *Mechanical Design Handbook*, McGraw-Hill
5. IEEE Standards

Lecture: 12:00 p.m.-1:50 p.m., M, W; Room 219, J.B. Moore Hall and Laboratory 304 Moore Hall

Instructor: Dr. Ernest L. Walker, Research Professor, P.E.
Office Location Room 424 P. B. S. Pinchback Hall

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Office Hours: As posted on Office Bulletin Board

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Course Coordinator: Dr. Ernest L. Walker

Preparation Date: April 2003

Prerequisites by topics: Senior standing and approval by the instructor and the department chair.

ABET Content:

Math/Basic Science: 0.0 credits

General Education: 0.0 credits

Engineering Topics: 0.0 credits

Engineering Design: 0.0 credits

Course Objectives:

1. Students will be able to develop and design a working system, using hardware, software, or both, that will be similar to that produced by an efficient real-world electrical engineering project team (Program Educational Objectives: 1-2 and 4-5).
2. Students will be able to effectively communicate their project to others, using both written reports and oral presentations (Program Educational Objective: 2).
3. Students will be able to work effectively as a member of a project group (Program Educational Objective: 2).
4. Students will demonstrate their abilities in project research and self-learning, engineering design, components search and purchasing, system prototyping, debugging, and teamwork (Program Educational Objective: 2 and 4).

Course Educational Strategies:

1. Instructor will provide lectures on the basic principles of engineering design.
2. Students will be organized in workgroups.
3. Students will meet weekly with advisors and make day entries in their project log books
4. Students will make oral presentations on their project proposals
5. Students will submit a final report on their project proposals

Course Content:

1. Lectures on engineering design topics; such as, the design process, design for mass production, reliability prediction, designing for safety and etc.
2. Team formation, project discovery and initial proposal presentation.
3. Final project proposal presentations and final project proposal reports.

Course Requirements:

1. Student must attend all sessions, unless excused by the instructor
2. Projects must exhibit original design work by the group by all of the group members.

3. Each design group must have a committee consisting of the project advisor and two other faculty members.
4. The design group must meet with the project advisor weekly and meet with the committee at the end of each semester.
5. Each student must keep a design notebook to log daily activities

Grading Policy: The final grade will be determined from the following weighted components:

Weekly Reports – 10%; Proposal Presentation – 10%; Final Presentation – 10%; Final Written Report – 30%; Attendance and Log Book – 10%; Contribution to team 10%.

An expected grading scale is as follows:

90-100 (A),

80-89 (B),

70-79 (C),

60-69 (D),

and below 60 (F).

COURSE ASSESSMENT:

| Course Objectives | Intended Educational Outcomes | Means of Assessment | Criteria of Success | Relationship to Program Outcomes |
|---|--|--|---|--|
| <i>Objective 1: Students will be able to develop and design a working system, using hardware, software, or both, that will be similar to that produced by an efficient real-world electrical engineering project team</i> | Students will develop & design and effectively demonstrate the ability to complete a design project. | 1. Weekly Reports 2. Oral presentations 3. Log Book entries 4. Final presentations & report | 1. Quality & soundness 2. Confidence & Clarity 3. Persistence of effort 4. Comprehensiveness | Program Outcomes: 2-4 ABET: a- k |
| <i>Objective 2: Students will be able to effectively communicate their project to others, using both written reports and oral presentations</i> | Students will demonstrate effective oral and written communication skills. | 1. Project proposal presentations 2. Final presentations & reports | 1. Evidence of effective writing skills 2. Evidence of effective presentation skills | Program Outcomes: 2 ABET: g and h |
| <i>Objective 3: Students will be able to work effectively as a member of a project group</i> | Students will demonstrate the their ability to work effectively in a group setting. | 1. Peer Evaluations 2. Log Books 3. Weekly reports | 1. 80% positive responses 2. Evidence of leadership team assignments | Program Outcomes: 2, 5 ABET: d, g, h, and i |
| <i>Objective 4: Students will demonstrate their abilities in project research and self-learning, engineering design, components evaluation and purchasing and system modeling prototyping</i> | Students will develop the ability to do self-discovery and become self –learners and implementers. | 1.Weekly reports 2.Log Books 3.Project Presentations | 1. Evidence of discovery of new ideas 2. Discussion of new ideas in presentations and reports | Program Outcomes: 1-3 ABET: a, e, f, g, and k |