Instructor:

Dr. Jeff Jackson, Professor and Department Head, Department of Electrical and Computer Engineering, 319 Houser, 348-2919, e-mail: jjackson@eng.ua.edu. Office hours: 9:00-10:00 MWF (or by appointment).

Web Site:

The Web-site URL for this course is http://jjackson.eng.ua.edu/courses/capstone. Students are expected to access this Web site frequently to obtain important information about the course. The contents include no less than the syllabus, assignments, and PowerPoint lecture material in html and pdf format. The site contents will be updated before every class period.

General Information:

In this course, students will be working in teams. Each design team will define and initiate a design project. A rigid structure and schedule will be imposed on your activities to ensure timely completion of the various phases of the project and adequate experience in a formal design methodology.

The design teams will be formed by the project supervisors. They may assign the teams, or they may allow students to select their own team members. In either case, team assignments are at the discretion of the supervisors and not the course instructor. However, once the assignments have been made, they will not be altered.

There will be two instructors for this course: a course instructor and a project supervisor. The course instructor will conduct in-class lectures, lead in-class discussions, and oversee the general presentation sessions. The project supervisors will help the design teams define their projects, serve as a technical consultant, and evaluate the technical aspects of your design. Both the course instructor and the project supervisor will be responsible for grading your presentations.

Project Supervisor:

Various ECE faculty teaching within the technical field of the lecture-laboratory combination selected as the corequisite for this course.

Goals:

The goals of this course are to introduce students to the steps in a systematic design process, provide design experience through a capstone design project, and build teaming, organizational, and communication skills. In addition to technical constraints, the design experience will incorporate relevant engineering standards, sustainability and manufacturability issues, and economic constraints. Students will also address environmental, ethical, health, and social impact issues relating to their design.

Ethics and Societal Impact:

Engineering is an applied science. What engineers do has a significant impact on society. We must act ethically, and we must be capable of assessing the environmental, health, safety, and social issues associated with engineering solutions and decisions. We must be capable of educating society on the impact of particular engineering solutions and gaining informed consent before implementation. We must be knowledgeable of contemporary issues. To help graduating engineers understand and perform these tasks, the Capstone Design course includes material and exercises on engineering ethics, societal impact, and contemporary issues. Attendance and satisfactory performance during these exercises is mandatory. As mentioned previously, your design must include consideration of the relevant engineering standards, sustainability, manufacturability, economic constraints, and environmental, ethical, health, and societal impact issues.

Engineering Economics:

Topical coverage will include economics for application to engineering projects, economic viability of engineering solutions, time value of money, cost-benefit analysis, design alternatives, life cycle analyses. Appropriate in-class and/or out-of-class exercises will accompany presentation of this material.
Design Phases:

Your overall design project will span two semesters and will proceed in five major phases:

- Develop the design proposal and project plan
- Complete the technical design
- Refine the technical design
- Validate the design by testing some implementation, prototype, or simulation
- Demonstrate and document the design

Each of the first four phases will conclude with a formal presentation. The first two phases will be completed during the present semester, thus ECE 492 will conclude with the presentation of a Preliminary Design Review by each team. In order to provide you with experience in reviewing technical presentations, peer review groups will be used during the all formal presentations. A detailed schedule for this semester will be presented later.

Basis for Final Grade:

In this course, your performance will be evaluated by the course instructor, your project supervisor, and your design team. This process is similar to a model often employed in industry where your peers, first-level supervisor, and second-level supervisor are responsible for your performance evaluations. Evaluations will be based on a 100 point scale with the weightings defined in the table below. Each grade received will be out of a total possible point value of 100 points.

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<tr>
<th></th>
<th>Course Instructor</th>
<th>Project Supervisor</th>
<th>Design Team</th>
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<tbody>
<tr>
<td>Proposal Presentation</td>
<td>10%</td>
<td>20%</td>
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<tr>
<td>Preliminary Design Review Presentation</td>
<td>10%</td>
<td>20%</td>
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<tr>
<td>Presentation Reviews (minimum of 2)</td>
<td>5%</td>
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<tr>
<td>Ethical and Societal Impact Exercises</td>
<td>5%</td>
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<td>Engineering Economics Exercises</td>
<td>5%</td>
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<tr>
<td>Individual Contribution</td>
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<tr>
<td>Progress Reports</td>
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<tr>
<td>Other Exercises</td>
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<td><strong>TOTAL</strong></td>
<td><strong>45%</strong></td>
<td><strong>50%</strong></td>
<td><strong>5%</strong></td>
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Class Attendance:

Attendance is required for all classes in which presentations are scheduled (whether or not you are presenting or reviewing). Exceptions will be made only in cases of documented emergencies or illnesses or for university approved activities. Attendance is expected for other lectures. In-class exercises may be a part of any required lecture.

Academic Dishonesty:

All cases of cheating will be handled promptly following the University’s and College’s *Code of Academic Conduct*.

Disruptive Behavior:

Disruptive behavior in the classroom of any kind will not be tolerated. This includes talking or using cell phones while class is in session.

Disability Statement:

It is the policy of The University of Alabama to make reasonable accommodations for qualified individuals with disabilities. Please contact the Office of Disability Services at 348-4285 to request disability accommodations. After initial arrangements are made with that office, contact your instructor.

Disclaimer:

The instructor reserves the right to alter these policies in whole or in part as circumstances and sound pedagogy dictate. Whenever feasible, the students will be given notification of any changes in class.