MISSISSIPPI STATE UNIVERSITY™
JAMES WORTH
BAGLEY
COLLEGE OF ENGINEERING
Department of Electrical and Computer Engineering

Instructor: Timothy E. Sellers
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Office Hours: By appointment in Webex (contact information posted on Canvas)

Lecture Time: MWF 10:00am – 10:50am Simrall Electrical Engineering. Building Room: 102
Lab Times: MWF 10:00am – 10:50am Simrall 302, 303, or 308

**Distance
Section Times:** Both lecture and lab are asynchronous – Videos available on Canvas weekly by MWF A.M.

Prerequisites: Prerequisite: Grade of C or better in ECE 4532
Corequisites: N/A

Textbook: No required textbook
Software: No required software
Website: Senior Design II

Course Description and Objectives
(Grade of C or better in ECE 3434 and ECE 453). One hour lecture. Three hours laboratory. Prototyping, documentation, and oral presentation of an engineering design project. Lectures on legal aspects and industry standards relating to design, professional ethics, career design skills.

After successfully completing this course, the students will be able to:

i. Collaborate with peers on an engineering team focused on designing, prototyping, testing, documenting, and managing a design project focused on a contemporary, real-world, technical problem.
ii. Demonstrate laboratory skills and simulation tool knowledge necessary for success in advanced ECE design activities.
iii. Demonstrate an advanced understanding of professional and ethical issues that arise in engineering practice including ethical responsibilities involved in the presenting and processing of messages.
iv. Design technical communication for a variety of target audiences using effective visual aids, and credible sources.
v. Critique and improve peers' technical communication.

Methods of Evaluation

Your grade will be calculated using the following breakdown and scale.

Grading Breakdown	
Assignment Type	Percentage
Weekly Deliverables	5%
Design Document (graded on a pass/fail basis!)	15%
Preliminary Design Review	5%
Final Design Review	10%
Hardware (Packaged)	35%
Advisor Evaluation	10%
Web Site	2%
1-min elevator pitch video(pass/fail)	3%
Business Plan	15%
Peer Review (positive peer points cannot raise a "C" grade or lower a "C" grade)	-10% to +10%

Grading Scale	
Grade	Average
A	100 – 90
B	89 – 80
C	79 – 70
D	69 – 60
F	Below 60

The goal of our two-semester sequence is to provide you with a realistic design experience and teach you the tools and methodologies that can help you be successful. To be considered for a passing grade in this portion of the class, your design review must convince the committee this project was finished. You must demonstrate a functional project at your design review, and that your hardware design meets your design requirements and simulation results.

A significant component of your grade will be your weekly assignments. These will include a mixture of assignments designed to help you make incremental progress on your project. We now use a popular project planning tool, Microsoft Project, in this course. This will help you plan your projects on a daily basis. Every Tuesday morning, you will be responsible for making a deliverable available on your web site. There will be approximately 13 deliverables over the course of the semester. These will be described in detail in class and via email. A schedule is provided below.

The design document developed in ECE 4532 will be updated and become the comprehensive description of the entire project including: requirements, test specification, design, and test certification. It presents both simulation data and hardware measurements (for the packaged version of the hardware!), demonstrating that your design has

met its goals. This document should address most of the points listed on the cover page of the course web site. Templates used in Design I will still apply.

Technical writing is a very important part of the overall course goals in senior design. Because you are supplied with a detailed Microsoft Word template for the design document, grading of the design document will be strict. Documents will first be graded based on their technical content. Next, for each infraction of the formatting guidelines, you will have one letter grade deducted from the overall grade for your document. A failing grade on the design document will be counted more heavily - a team cannot receive a grade higher than a C in this course if they fail the design document component of the course.

The preliminary design review should be a dry run of the final presentation. It is a 15-minute presentation that provides a vigorous review of the project. The emphasis in the second semester of the course is on creation and testing of the packaged version of the project. At this stage of the course, you will be expected to show the first version of your packaged hardware, along with a comprehensive testing plan.

The design review must address all design deficiencies noted in your preliminary review and review all aspects of the project (with technical detail supporting your claims). This will be a 15 -minute presentation. At the time of the design review, a project web site must be available containing all information about the project, including the documents described above and the design review presentation.

Concurrent with the design review, we will host a conference -style packaged hardware demonstration. This will be set up in a room adjacent to the presentations and consist of a conference booth type format where each team is allocated a table at which they will demonstrate their hardware. Each team will be responsible for constructing a poster providing an overview of the project. Faculty, student, and industrial representatives will visit each project and provide a detailed evaluation of the hardware. This portion of the final design review will last about three hours and run concurrently with the design presentations.

Another significant component of your grade is derived from your advisor's evaluation of role on the team, peer review, and team self-assessment. Remember a prime directive: "Keep your advisor happy." The rationale your advisor uses to arrive at your grade is at his or her discretion. Be sure to communicate with your advisor to fully understand his or her expectations. Also, your exchanges with fellow team members should involve good listening skills, the distribution of the responsibility and, most important, follow through. Good teamwork requires care, skill, and effort.

The project website will be graded according to its comprehensiveness. A good site will contain a complete archive of the project, including all documents, presentations, data, measurements, schematics in source file format, software, etc. Web sites are graded on a competitive basis so keep an eye on your competition. WARNING: If your website does not contain your complete design data (datasheets, schematics, PCBs, code) then it will be assigned a maximum of 1 point out of 5 possible points.

Your course grade will be computed using the categories and weights described above. Final grades can be adjusted by plus or minus 5% based on feedback collected from a peer review or self-assessment process. Ideally, all team members contribute equally and, as a result, the team achieves their grade goals. Occasionally, peer review reveals that contributions are markedly uneven, despite all efforts to address the project as a team. As a part of self - assessment process, team members will submit a written evaluation of their fellow team members. All claims of mutiny, insurgency, poor performance, etc., must be documented in sufficient detail to be given consideration.

We will attend some entrepreneurship lectures this semester in coordination with GE 3011. Developing an appreciation of those issues discussed in the entrepreneurship series offers the opportunity to distinguish yourself from other job applicants. The entrepreneurship lectures are one means by which we encourage you to start thinking about important non-technical aspects of your career.

You will also write a simple business plan for your project. We will describe the details of this assignment in subsequent lectures. Teams are encouraged to enter the business plan competition and compete for the generous prizes offered by the College. Online tools at bplans.com are available on-line for guiding you through the development of your business plan.

Grading Policies

Preparation, self-regulated learning, and participation are expected and required throughout the semester. In an online course, this is demonstrated through consistent log ins to the Canvas site, frequent email reading and responding, viewing course videos, and timely submission of assignments. If you have an unexcused deficiency in any of these areas, you will be notified via email.

Due dates matter. Assignments must be turned in on the due date by the time specified. Assignments that are late receive no credit. Deadline extensions may be requested via email for unusual situations beyond your control (e.g., emergencies that occur with you or your family) and may be granted solely based on the instructor's discretion. Asking for extensions for non-emergencies is highly discouraged. If you have travel planned, you should submit your assignments on time.

LECTURE TOPICS (15 contact hours) (Topics Are subject to change)
  I.   Organization and Topical Overview of the Course (1 hour)
  II.   Printed Circuit Boards (3 hour)
         a.   History of printed circuit bords (1 hour)
         b.   How to design printed circuit boards (1 hour)
         c.   Mini project (1 hour)
  III.   Business Plan (2 hours)
         a.   Introduction to Business Plan and Initial Business Plan (1 hour)
         b.   Developing a Business Plan and Company Financial Plan (1 hour)
  IV.   Subsystem Testing (2 hours)
  V.   Subsystem Integration (1 hour)
  VI.   Ethics in Engineering (2 hour)
  VII.   Periodic Project Design Review and Feedback (4 hours)
         a.   Progress Meetings Reviews 1 (1 hour)
         b.   Progress Meetings Reviews 2 (1 hour)
         c.   Progress Meetings Reviews 3 (1 hour)
         d.   Final Design Review (1 hour)

LABORATORY TOPICS (30 contact hours)

I. ECE 4522 and ECE 4542 laboratory sessions are self-regulatory and a dedicated time for the students to utilize laboratory spaces to design, implement, troubleshoot, and implement their projects. The instructor will be present for 1 contact hour each week during the laboratory hours within the designated laboratories to assist the students in various aspects related to the projects. (15 hours)

II. Student Demonstrationsand Troubleshooting (15 hours)
   a. Each group will be asked to demonstrate their project mid-way through the semester (7.5 hours)
   b. Each group will be asked to demonstrate their final working of project (7.5 hours

ECE 4542 Class Information

Tools (Simral (301,303, and 308)
In the lab rooms above, you will find a wide range of tools and devices, such as 3Dprinters, power tools, and soldering stations, oscilloscopes, computers, printers, scanners, assortments of ICs, resistors, transistors, capacitors to carry out the projects.

Students registered for ECE 4542 on the Starkville campus will be allocated project budgets that will enable them to purchase additional components necessary to successfully execute their projects.

Expectations for the ECE4542 Classroom and Communication
The following policies for course communication apply for **ALL students**:
- You are required to check your MSU email account regularly. This is considered an official means of communication by MSU for distance education students.
- The course materials will be accessed through Canvas.
- You are required to have access to a computer that connects to the internet.
- Students should direct correspondence to the instructor directly related to the class via the mail feature in Canvas or Outlook
- Students are encouraged to discuss business plans with each other to improve and enhance their understanding of a true business plans.
- Student are required to check the syllabus section on canvas for the course schedule. This course is a project based course and as such we will not meet every class period. It is the students' responsibility to check canvas for any updates and class meeting times.

The following policies for course communication apply to **students enrolled in the Distance section**:
- Faculty office hours will be hosted in WebEx. Students can join using a computer or smartphone app.
- Students can correspond with each other via the general course discussion board. Please note that collaboration on individual projects is not acceptable.

Minimum Technology Requirements
The following minimum technology requirements are necessary **for all students** to complete the course:
- Computer with web browser and Microsoft Office
- Internet access

ECE 4542 CPE Design II
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Distance students will also need:
- Webcam and microphone (computer or smartphone) to upload video responses to assignments or participate in virtual meetings / office hours.
- Video recording and editing software (Camtasia is available to download free from MSU ITS)

Technical Assistance
If you have questions about this course, please contact the instructor via Canvas messaging. For technical support (e.g., computer support, Canvas issues), please contact help@ece.msstate.edu or engr-dist-support@lists.msstated.edu or www.bagley.msstate.edu/distance.

Assignment Submissions
Submit assignments well before the deadline! Engineering is often more about creating an efficient process than the final product, and engineering education is very similar. ECE 4542 is a large class with many assignments. In order to be efficient, ECE 4542 uses the Canvas classroom management system for almost all "classroom transactions": assignments are made via Canvas, homework assignments are submitted to Canvas, if you have an issue submitting files to the Canvas system before the scheduled deadline, your only remedy is to submit an official grade concern (see the grade concern policy on Canvas). However, note that grade concerns without evidence of an unusual or exceptional circumstance will typically not fare well.

Attendance Policy for face-to-face instruction
Students registered in face-to-face sections are expected to attend all class meetings. Attendance is verified through card scanners; if you fail to scan your ID, you will be marked as absent. Please refer Academic Operating policy 12.09. (http://www.policies.msstate.edu/policypdfs/1209.pdfLinks to an external site.), regarding attendance expectations and accommodations. Note that official, university-approved and documented absences are not subjected to attendance penalties. It is the student's responsibility to initiate a request of making up course work in a timely manner. Unless impractical, all communication regarding official, university-approved and documented absences and make-up work should take place prior to the absence. Students are responsible for all material covered during class and any in-class announcements.

Attendance Policy for distance instruction
Distance students are expected to "attend" every class meeting by watching assigned lecture videos and reading assigned material. Both lecture and lab meetings are asynchronous, which means you can "attend" (e.g., watch videos) at a time convenient for your weekly schedule. However, you must attend class and turn in assignments according to the weekly class schedule and assignment due dates.

UNIVERSITY POLICIES

Continuity of Instruction

In the event that face-to-face classes are suspended due to extenuating circumstances, such as weather, the instructor will continue instruction in a manner that best supports the course content and student engagement. In this event, all instructors will notify students of the change via their university email address (the official vehicle for communication with students). At that time, they will provide details about how instruction and communication will continue, how academic integrity will be ensured, and what students may expect during the time that face-to-face classes are suspended. If a student becomes unable to continue class participation due to extenuating circumstances, (e.g., health and safety, loss of power, etc.) the student should contact their instructor and advisor for guidance. For additional guidance, please refer to Academic Operating Policy 12.09.

Mississippi State University Honor Code   http://www.honorcode.msstate.edu/

"As a Mississippi State University student I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do"

Upon accepting admission to MSU, a student immediately assumes a commitment to uphold the Student Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Student Honor Code. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the MSU community from the requirements or processes of the Student Honor Code.

If found cheating on <u>any</u> assignment, the instructor will most likely recommend the student receive an "F" in the course.

Title IX   http://students.msstate.edu/sexualmisconduct/

MSU is committed to complying with Title IX, a federal law that prohibits discrimination, including violence and harassment, based on sex. This means that MSU's educational programs and activities must be free from sex discrimination, sexual harassment, and other forms of sexual misconduct. If you or someone you know has experienced sex discrimination, sexual violence, and/or harassment by any member of the MSU community, you are encouraged to report the conduct to MSU's Director of Title IX/EEO Programs by phone (662 -325-8124) or email (titleix@msstate.edu). Additional resources are available at http://www.msstate.edu/web/security/title9-12.pdf.

University Safety Statement

Mississippi State University values the safety of all campus community members. Students are encouraged to register for MaroonAlert texts and to download the Everbridge App. Visit the Personal Information section in Banner on your mystate portal to register. To report suspicious activity or to request a courtesy escort via Safe Walk, call University Police at 662-325-2121, or in case of emergency, call 911. For more information regarding safety and to view available training resources, including helpful videos, visit ready.msstate.edu.

Disability Resource Center   www.drc.msstate.edu

Mississippi State University is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (01 Montgomery Hall) collaborates with students who have disabilities to arrange

reasonable accommodations. If you have, or think you may have, a disability, please contact drc@saffairs.msstate.edu or 662-325-3335 to arrange a confidential discussion regarding equitable access and reasonable accommodations. Disabilities may include, but are not limited to, conditions related to mental health, chronic health, attention, learning, autism, brain injury, vision, hearing, mobility, speech, or intellectual disabilities. In the case of short-term disabilities (e.g., broken arm), students and instructors can often work to minimize barriers. If additional assistance is needed, please contact the Disability Resource Center.

Copyright
Copyrighted materials within the course are only for the use of students enrolled in the course for purposes associated with this course and may not be retained or further disseminated.

Course materials must not be posted on any website or added to any database without the instructor's written permission. Do not distribute test problems, homework, or any other materials. Do not post course materials on websites such as chegg.com, slader.com, etc. Violations of this policy will be referred to the Honor Court.