

# University of Texas at El Paso

## EE 4220 Senior Projects Lab I

### Spring 2021

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**Required Textbook:** Design for Electrical and Computer Engineers— Theory, Concepts, and Practice, R. M. Ford and C.S. Coulston, ISBN 978-0-07-338035-3, McGraw-Hill

#### **Course Objectives:**

1. To develop an electronic functional system that incorporates and demonstrates competency in the four concentration areas (Computer Engineering, Fields and Devices, Systems/Communications, and General Electrical Engineering) of the Bachelor of Science in Electrical Engineering degree. The system should be capable of processing inputs in order to generate usable outputs. It should include a minimum:
  - a. Computational Component (Laptop, Microcomputer, microprocessor, or microcontroller)
  - b. User interface
  - c. Sensors
  - d. Design and fabrication of a printed circuit board
2. Develop the proper documentation required to support and duplicate the project.
3. Effectively communicate, orally and in writing, the project work to faculty, project sponsors and other students.
4. The design is concluded in EE 4230.

#### **Grading:**

A = 90 – 100%

B = 80 – 90%

\*C = 70 – 80%

D = 60 – 69%

F = Below 60^

**\*Passing Grade of C or better is required**

#### **I. Assignments**

1. Must be:
  - a. Typewritten and should include name, title of assignment, due date, and pages numbered sequentially.
  - b. Stapled on the upper left-hand corner of paper.
  - c. Bring two copies to class, and send one electronic copy to the Instructor and

T.A.'s via email.

2. Spelling, punctuation, grammar, and neatness count 20%. There will be no make-up work or extra credit assignments during the semester.

## II. Miscellaneous

1. You are encouraged to pick up your assignments, quizzes, etc... If they are not picked up after two weeks, they will be destroyed
3. This syllabus is subject to change at any time with prior notice.

## III. Incompletes

1. Are not granted in this course.

**IV. Attendance.** Attendance in the lab and lecture will be recorded using online tools. Students must attend each session at least 90% of the time or they will be considered as absent from the session. The student's grade will be decreased one letter grade for every 3 absences. When absent, the student is responsible for obtaining notes, handouts, and assignments and will be required to meet the same deadlines as the rest of the class. Excused absences are limited to documented religious holidays and UTEP sponsored activities only. If you do have an emergency, please notify the instructor as soon as possible. Emergencies happen, unexpected situations arise, and you should use common sense and safe precautions when trying to get to lecture and/or lab.

**V. Teamwork and work ethic.** Positive work ethic is individual or group behavior leading to a systematic growth of productivity, reliability, accountability, and a sphere of healthy professional relationships (vs. *R. Vaux. "Negative Work Ethic Definition". Houston Chronicle*). Twenty percent of your final grade will be based on observed laboratory work, its quality, and its impact on the work of other team members. In every laboratory session, you must perform tangible work that makes progress toward the achievement of your individual project deliverables and those of the other team members. During every laboratory session, you must be able to provide to the instructor and the teaching assistant detailed technical descriptions of the work you have previously performed, activities under way during that session, and estimates of work remaining during the semester. You must also demonstrate familiarity with the work being performed by the rest of your team and its impact on the team project deliverables.

### **Work to be completed by the end of the first Senior Projects semester:**

1. Attend all lab sessions as an integrated group. ***No more than 2 unjustified absences will be allowed. The student will be dropped from the course if 3 or more unjustified absences are accumulated during the semester.***
2. All electronic circuit designs must be simulated & completed.
3. All electronic computer simulations done via Proteus
4. All circuit components to be used in the final system properly identified, including vendors and prices.
5. All circuit components purchased.
6. All mechanical, optical, acoustical, etc. designs completed.

7. All non-electrical parts sources identified. Costs established and parts ordered.
8. Commercial software identified and ordered.
9. New coded software completed and tested.
10. Laboratory Notebooks completed.
11. All subsystems functional and operational on breadboard.
12. Full **Technical Report** Completed.

### **Tentative Spring 2021 Course Schedule:**

#### **WK NOTES**

- Project overview, team formation, project selection, Laboratory hours
- Project proposal reviews, technologies to be used,
- Block diagrams and schematics including individual workload.
- What the system will deliver, specifications (Research)
- Subsystems analysis (Diagrams and list of components)
- Subsystems analysis and simulations
- Complete Simulations (if applicable)
- Design reviews, simulations, components selection
- Functional breadboard checkout presentations
- Final Senior I Project System Demo