XYZ 487. Senior Design

**ADMINISTRATIVE DETAILS**

**Catalog Description:** Engineering Design Exhibits I (0-6-2)

Prerequisites: All 100- and 200-level engineering, mathematics, and science courses, TCO 340 or TCO 341, and any specific specialization requirements.

Corequisites: As specified by specialization requirements.

Multi-disciplinary design projects. Small groups design, build, and test realistic engineering systems under faculty supervision. Projects include safety, economic, environmental, and ethical consideration and require written and oral reports.

**Instructor Information:**

 Dr. Laura Lackey SEB 105, lackey\_l@mercer.edu, x4106

**Course Outline:**

 Week Major Activity

1. Gather information (client, faculty, library, WWW, etc.)
2. Write project proposal, start Thursday meetings.
3. Submit proposal on Tuesday, prepare for proposal presentation
	1. Define feasibility and merit criteria.
4. Develop design alternatives.

4-7 Perform engineering analysis and cost analysis.

7 Apply feasibility and merit criteria – select best alternative.

8 Team presentations of status report

* 1. Refine design, prepare drawing.
1. Finalize drawings, written report – rehearse for PDR.
2. Make Preliminary Design Review presentation to faculty.\*

 13 Respond to requirements imposed at PDR.

 14-15 Develop comprehensive test plan, order parts

 16 Submit comprehensive test plan.

**Grading:** The following is used as a guideline for determining grades:

 Proposal (written and oral) ……………………………….. 10%

 Professionalism……………………………....……………. 15%

Progress Reports, Schedule of Deliverable Attendance, Responsiveness, Ownership, Responsibility, Ethics

 Preliminary Design Review (PDR)

 Reporting

 Written ……………………...…………… 30%

 Oral ………………………...……………. 10%

 Engineering Content…………….………………… 25%

 Quality/Merit

 Comprehensive/Quantity

 Accomplishment/Difficulty

 Test Plan …………………………………………………… 10%

 Final Exam ……………………………….………….. -5 or 0%

 Teamwork …………………………………… +/- Adjustment

**The above grading rubric assumes that all course requirements have been attempted in good faith. If any requirements are overlooked or disregarded, the instructors reserve the right to assess serious grade penalties.**

Individual student grades for team assignments (Proposal, PDR, Test Plan) will be adjusted based on peer ratings of yourself and team members as well as teamwork evaluations from management, clients, and technical advisors. A grade of **incompletes (IC)** will be awarded only to design teams that experience extenuating circumstances during the term. Poor time management will not be considered a valid justification for the award of an **IC** grade.

**Georgia Engineering Foundation Award:** The senior design project judged as “best” by the School of Engineering faculty will receive an award at the Mercer University Awards Day Ceremony at the end of the school year which may be accompanied by a cash prize from the G.E.F.

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|  |  | Tuesday | Tuesday Deliverables | Thursday Meetings |
|   |   |   |   |   |
| Week 1 | 1/7 | Course Introduction and Administration |  | 01/09 |
|   |   |  |  |  |
| Week 2 | 1/14 | Brainstorming - Dr. Laura Moody |  |  |
|   |   |  |  |  |
| Week 3 | 1/21 | Mock Proposal Presentation | **Written Proposal** | 01/23 **Project Proposal Description** |
|   |   |  |  |  |
| Week 4 | 1/28 | Proposal Presentations | **Oral reports** |  |
|   |   |  |  |  |
| Week 5 | 2/4 | Engineering Analysis - Dr. Loren Sumner |  | **02/06****Progress report** |
|   |   |  |  |  |
| Week 6 | 2/11 | Codes and Standards/Ethics Lecture/Exam |  |  |
|   |   |  |  |  |
| Week 7 | 2/18 | No Lecture |  | 02/20 |
|   |   |  |  |  |
| Week 8 | 2/25 | Status Presentations | **Oral reports** |  |
|   |   |  |  |  |
| Week 9 | 3/4 | Designing Written Reports (TCO) |  | **03/06****Progress Report** |
|   |   |  |  |  |
| Week 10 | 3/11 | Spring Break |  |  |
|   |   |  |  |  |
| Week 11 | 3/18 | Effective Oral Presentations (TCO) |  | 03/20 |
|   |   |  |  |  |
| Week 12 | 3/25 | No Class | **PDR Deadline - Friday 03/28/2014** |
|   |   |  |  |  |
| Week 13 | 4/1 | Test Plans, Career Planning |  |  |
|   |   |  |  |  |
| Week 14 | 4/8 | No Class |  |  |
|   |   |  |  |  |
| Week 15 | 4/15 | No Class |  |  |
|   |   |  |  |  |
| Week 16 | 4/22 | Course Review / Peer Review / On-Line Evaluations | **Test Plan** |  |

**Deadlines:**

3:05pm, Tuesday, January 21st – Written proposals due/Project Proposal Description Form

3:05pm, Tuesday, January 28th – 10-min. proposal presentations to class

02/6 and 03/06 – Individual Progress Report detailing your deliverables

3:05pm, Tuesday, January 25th – Team status reports – 10-min. presentations to class

4pm, Friday, March 28th – Latest time slot to present PDR

3:05pm, Tuesday, April 22th – Test plans due, Final exam - course critique/evaluation

**Project Status Memorandum:**

Each team is required to submit a project status memorandum at each Thursday management meeting. Detail the status of accomplishments and plans for the next two weeks **with a table showing participating members, action items, deliverables, deadlines, and date completed**. Be prepared to consult with management about your plan of action.

**Attendance:** Attendance at the lectures, laboratories, and other scheduled meetings is required; Absences will influence your course grade through a professionalism evaluation shown in the grading rubric above. Chronic absence may result in a grade of F. After the lecture and discussion portion of each regularly scheduled attendance, design teams are expected to use the remainder of the period to work on the project. **You are also required to attend and evaluate at least two PDRs/CDRs presented by others enrolled in XYZ 487/488.**

**Meetings:** You are expected to meet frequently (at least bi-weekly) with both your principal evaluator and your technical advisor. You are also expected to keep your client informed about key details of the project. Make appointments for these sessions, prepare and present a brief oral progress report at each, and use the time profitably to ask questions, discuss alternatives, etc. Bring your project notebook to these meetings and be prepared to use the included materials.

**Project Notebook:** Each team should maintain a loose-leaf notebook which, by the end of XYZ 488, will contain a complete record of the team’s efforts on this project. This record will be brought to each class attendance, each meeting with course instructors, and each meeting with the team’s technical advisor or client. As a minimum, it will contain tabbed sections as follows:

 Administrative Details (this guide, etc.) Proposal

 Ideas/Sketches/Engineering Drawings Cost Analysis/Cost Records

 Engineering Analysis Preliminary Design Review

 Timetable (PERT/CPM, Gantt, etc.) Progress Reports

 Test Plan/Test Results Project Notes

 References Activities Logs

**At the End:** At the end of XYZ 487, each group must have a completed design or plan supported by appropriate analyses. That design or plan will be complete enough that it could be executed by anyone skilled in the appropriate technology. For example, the design of an artifact must include a **complete** set of drawings to include working drawings of all parts to be made, assembly drawings explaining how the parts go together, and a bill of materials describing what items to purchase before the parts can be made and assembled. If no such design or plan exists, the XYZ 487 effort is unsatisfactory.