Engineering Capstone Design II
ENGR 4270

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Office: STEM 207N (or Zoom)
Office Hours: M-W 11:00 am - 1:00 pm
F 10:00 am - 12:00 pm
If you are not able to stop by my office, you can meet me via Zoom, please send me an email in advance to set a meeting time.

Department: Department of Physics, Engineering and Astronomy
Class meeting time and place: Lecture – WF 1:00 – 2:15 PM / STEM 202

Course Description:
The capstone project initiated in ENGR 4260 is taken from a prototype to a finished project. The project then undergoes laboratory testing and evaluation. Students present their results on a research poster and in oral presentations. Prerequisite: ENGR 4260.

Text and Materials (Recommended, Not Required):

Course Calendar:

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan 15</td>
<td>Topics Review, Project Updates, Review PDS</td>
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<td>2</td>
<td>Jan 22</td>
<td>BOM, Make vs. Buy</td>
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<td>3</td>
<td>Jan 29</td>
<td>Prototyping: Drawings &amp; Tolerances</td>
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<td></td>
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<td>Business Meeting</td>
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<td>4</td>
<td>Feb 5</td>
<td>Prototyping: Engineering Testing</td>
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<td>5</td>
<td>Feb 12</td>
<td>DFM/DFA</td>
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<td>6</td>
<td>Feb 19</td>
<td>Reliability and safety in design, FMEA</td>
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<td>Business Meeting</td>
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<tr>
<td>7</td>
<td>Feb 26</td>
<td>Prototype Fabrication: Finalize drawings</td>
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<td>8</td>
<td>Mar 4</td>
<td>Design Presentation to Panel</td>
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<tr>
<td>9</td>
<td>Mar 11</td>
<td>Spring Break</td>
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<tr>
<td>10</td>
<td>Mar 18</td>
<td>Prototype Rework: Incorporate changes from panel</td>
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<td>11</td>
<td>Mar 25</td>
<td>Application of Design in Current Market</td>
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<tr>
<td>12</td>
<td>Apr 1</td>
<td>Engineering Ethics in Design, NSPE Code of Ethics</td>
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<td></td>
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<td>Business Meeting</td>
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<tr>
<td>13</td>
<td>Apr 8</td>
<td>Prototype Testing</td>
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<td>14</td>
<td>Apr 15</td>
<td>Design Review: Drawings and Prototype</td>
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<tr>
<td>15</td>
<td>Apr 22</td>
<td>Design Review: Final Testing</td>
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<td>16</td>
<td>Apr 29</td>
<td>Final Design Presentation</td>
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<tr>
<td>17</td>
<td>May 6</td>
<td>Final Design Report is Due</td>
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Work Submission:
Student grading for submitted work will be judged by whether the work is neat, complete, and organized. The number of submissions for work will also be used to grade relative to other students in the group. Therefore, it is required that any information a student generates for the project (tables, graphs, PowerPoint slides, etc.) should be accompanied by the initials of the student. If multiple students work on a single task, then list them as well. For instance, if one student is responsible for taking meeting minutes, then record that student’s initials in a “recorded by:” label on the minutes page. Further details on required work in the notebook as well as project reports will be given in class.

Presentations:
Grading for presentations will be based partially on written comments by invited faculty. Presentations are tentatively scheduled during the 4:00 – 4:50 pm time slot on Thursdays reserved for seminar (dates to be reviewed in class). Each presentation will require all members of the team to speak. The organization of the presentation will be at the discretion of the students. Practice presentations may be required by the instructor prior to the scheduled time for the talk.

Peer Evaluations:
A portion of the grade will be based on peer review as outlined above. Peer reviews will be anonymous to the rest of the team. This metric is included to encourage all team members to contribute to the project. Severe instances of student non-participation will be dealt with on a case-by-case basis.

Business Meeting:
At least once a month each team will meet with the professor, and other professionals to discuss progress related to the project. The team will be judged based on their ability to answer questions with facts, and proper documentation. The teams should be treating this as a meeting with their boss and the customer. The meeting time will not exceed 10 minutes, make sure that the team is on time and ready.

Grading Policy:
The following grading policy is used to evaluate the performance of the teams. However, due to the nature of the course, if a project is not completed and functional. An incomplete (I) grade will be given to the team. The actual grade will be granted once the group presents a functioning prototype. This might sound harsh, but if you think carefully, a company will fire you if you submit a partially functioning design by the deadline. At least here, you have an opportunity to finish.

| Final Engineering Drawings and Prototype | 10% |
| First Design Presentation | 10% |
| Final Design Presentation | 10% |
| Detail Design Report | 20% |
| Course Exercises | 20% |
| Digital Notebook, Peer Review | 30% |

Late Policy
Any assignment should be returned in time. In the case that the assignment is returned late it will be affected by the following policy:

<table>
<thead>
<tr>
<th>Time Late</th>
<th>Deduction</th>
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<tbody>
<tr>
<td>Less than 2 hours</td>
<td>5</td>
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<tr>
<td>More than 2 hours less than 12</td>
<td>10</td>
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<tr>
<td>More than 12 hours less than 24</td>
<td>20</td>
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<tr>
<td>More than 24 hours less than 48</td>
<td>50</td>
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<tr>
<td>More than 48 hours</td>
<td>100</td>
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Submission Guidelines
As engineers, you should learn how to be organized, you will need to present reports and results to your superiors and these need to be professional. For that reason, you will need to start learning how to be organized. The homework should be returned complying with the following format:

1. Use clean paper that will scan properly
2. Name should be on the top left corner
3. Pages should be numbered on the top right corner using the following format “3/10”
4. Problems should be organized and in order
5. Problem number should be clear and readable
6. Only one document should be submitted in PDF format
7. Use the following file naming format “TeamName_DocumentName.pdf.” For example
   Team_HOA_Conceptual_Design.pdf

Failing to comply with any of these will result in a 10 points deduction.

Attendance Policy:
Attendance will be taken at the beginning of each class. If you have 3 unexcused absences, then your final grade will be reduced by one letter grade. If you have 4 unexcused absences, you will receive an “F” in the course. To receive an excused absence a written and signed notice is required within three class days of the absence. If you miss class without the approval of your instructor, you will receive a grade of zero on the missed assignment. Authorized absences must be approved by your instructor in advance of the absence unless you have an emergency or illness. Make-up work must be completed outside of normal class hours and within one week following an excused absence. It is your responsibility to see your instructor and make arrangements for make-up work.

General Education Core Curriculum Objectives/Outcomes (EEO)
There are no specific general education core curriculum objectives in this course. This course is not a general education core curriculum course.

Credit Hour Justification
Meets 3 hrs/wk for 15 weeks, and also meets for a 2-hour final examination. This is a problem-oriented class and lab with homework problems. The lecture and lab combine for 5 hours and 20 minutes of contact time each week and the work outside of classes each week for the combined courses averages much more than 10 hours and 40 minutes in working homework problems, preparing and answering quizzes, reading the book to understand the theories used in lecture and in homework problems and exams, reading the lab manual to prepare for the lab experiments done each week, writing up the lab experiments, writing formal laboratory reports, and studying for exams which include major exams and possibly short lecture quizzes.

Academic Integrity (A-9.1)
The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff, and students to adhere to and uphold this policy.

Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5)
Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

**Definition of Academic Dishonesty**

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at [http://www.sfasu.edu/policies/academic_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp)

**Withheld Grades Semester Grades Policy (5.5)**

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the coursework because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course to compute the grade point average. For additional information, go to [https://www.sfasu.edu/policies/course-grades-5.5.pdf](https://www.sfasu.edu/policies/course-grades-5.5.pdf)

**Student with Disabilities:**

To obtain disability-related accommodations, alternate formats, and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services promptly may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).

Students with special accommodation requests have the responsibility to immediately initiate a meeting with the instructor to discuss how the special accommodations will be provided. Students who are aware of these special needs at the beginning of the semester must inform the instructor in person before the twelfth-class day about any class activity, which will require special accommodations.
**Student Wellness and Well-Being**
SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc.

If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

**On-campus Resources:**
The Dean of Students Office (Rusk Building, 3rd floor lobby)
www.sfasu.edu/deanofstudents
936.468.7249
dos@sfasu.edu

SFA Human Services Counseling Clinic Human Services, Room 202
www.sfasu.edu/humanservices/139.asp
936.468.1041

The Health and Wellness Hub “The Hub”
Location: corner of E. College and Raguet St.

To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:
- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education
  www.sfasu.edu/thehub
  936.468.4008
  thehub@sfasu.edu

Crisis Resources:
- Burke 24-hour crisis line: 1.800.392.8343
- National Suicide Crisis Prevention: 9-8-8
- Suicide Prevention Lifeline: 1.800.273.TALK (8255)
- johCrisis Text Line: Text HELLO to 741-741