Course Description:
Students will utilize computer-aided engineering (CAE) to understand concepts in geometric modeling and engineering graphics with applications to mechanical design. Topics will include fundamentals of design; modeling visualization and preparation of engineering drawings including multiview 3-D representations: orthographic projection and isometric perspective; solid modeling; dimensioning and tolerancing; modern prototyping and manufacturing techniques.

Prerequisites:  None

Co-Requisites:  None

Credits:  3 Hours  (Lecture:  3 Hours)

Instructor:  Christopher J. Aul

            W. E. Howard & J. C. Musto
            McGraw-Hill Education
            ISBN: 978-1259820175

Supplemental Materials:  None

Topics Covered:
Fundamentals of design; modeling visualization and preparation of engineering drawings including multiview 3-D representations: orthographic projection and isometric perspective; solid modeling; dimensioning and tolerancing; modern prototyping and manufacturing techniques.

Course Learning Outcomes
By the end of the course, a successful student will be able to:
1. Apply skills in software designed for computer-aided design (CAD) and computer-aided engineering (CAE) to (SO-6):
   a. Create a 2D representation of a 3D model
   b. Detail a CAD drawing with appropriate dimensions and tolerances
   c. Create a 3D model with a standard set of 2D representations (a sketch)
   d. Combine multiple objects into an assembly
   e. Simulate mechanical motion of an assembly to illustrate design intent
2. Analyze an existing engineering design to (SO-6):
   a. Identify design intent of each component in a complex assembly
   b. Measure components to recreate engineering design in a CAE environment
   c. Determine materials used in existing design and estimate physical properties
   d. Find potential for design improvements in existing design
3. Improve, change, or add new function to the design intent of an existing design to (SO-2):
   a. Create a new CAD model to illustrate improvement/change
   b. Test new CAD model for effectiveness
   c. Outline new CAD model and its performance in a technical report
4. Present technical information on CAD/CAE design to others (SO-3)
5. Show how engineering design can impact society, environment, and economy (SO-4)
Student Outcomes
Graduates of the program will show:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
Engineering 1310 & 1010 – Fall 2021
Geometric Modeling for Mechanical Design
Department of Physics, Engineering, and Astronomy; Stephen F. Austin State University

Instructor: Christopher J. Aul, PhD
Office: Meet me in my Laboratory at Room 211 (STEM Building)
Student Hours: MWF 10-11am, TR 1-2pm, or by appointment
Class Meetings: TR 4:00 PM - 5:40 PM, STEM Building Room 314
Course Home Page: http://d2l.sfasu.edu

Classes will be held over ZOOM and attendance is required, please use links provided via D2L

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Text and Materials:

I will be assigning homework directly from the text so it is important that you obtain a copy of this edition or similar. You do not have to obtain any online materials.

Grading Policy:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Design Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Detailed Design Exam</td>
<td>20%</td>
</tr>
<tr>
<td>New Model Design Exam</td>
<td>20%</td>
</tr>
<tr>
<td>In-class Assignments</td>
<td>10%</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>15%</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>15%</td>
</tr>
</tbody>
</table>

Letter grades are based on the following ranges:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90.0 – 100%</td>
</tr>
<tr>
<td>B</td>
<td>80.0 - 89.9%</td>
</tr>
<tr>
<td>C</td>
<td>70.0 - 79.9%</td>
</tr>
<tr>
<td>D</td>
<td>60.0 - 69.9%</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 60.0%</td>
</tr>
</tbody>
</table>

Exams:
The three exams in this course will be “take home” and consist of detailed instructions from the professor. The tentative due dates for these exams are shown in the course outline. A grading rubric will be provided and the exams should be constructed in a report-style format. Due to the nature of take-home exams there will be no make-up exams given. Late exams will be accepted with a penalty of 20% for each day the exam is late (i.e. if the exam is turned in two days late the maximum possible score the student could attain is 60 points out of 100). This penalty is increased to 50% for the New Model Design Exam due during the final exam time for this course (see calendar).
In general, you will be required to spend at least 2 hours of time outside of class for every hour spent in class. Considering this class meets for 3 hours a week it is important to spend at least 6 hours working with course material outside of class. It is encouraged that you spend more time than this to properly attain course subject matter.

In-Class Assignments:
The course will largely be software based using SolidWorks 2020. I will assign work to be completed within the class time using this software. I will also give in-class quizzes to be completed within the time of the class. The quizzes will be over material covered and may be closed-note and closed-book. See the Attendance Policy for rules on missing work due to absence. The grading for in-class assignments and quizzes will be averaged for 10% of your final grade. Details for in-class assignments and quizzes will be reviewed in class.

Final Presentation:
Your “Final Exam” of sorts will be an in-class presentation of your design at the end of the semester. Details for what is required in the final presentation will be given in class. Tentatively the presentation will be on the order of 10 minutes and will include a PowerPoint presentation with images explaining your final design. It is the goal of the presentation to assess technical communication skills. Pertinent training for technical presentations will be given in class.

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. Being late to class will be recorded as a “late” for the student. Two recordings of “late” will be counted as a single absence.

To receive an excused absence a written and signed notice is required within three class days of the absence. If you miss class without 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.
Email Communication
All official course communication will be made using your SFA email account. You must use your SFA email account for all communications. You will be notified via your SFA email account about grades and attendance. You can look up your SFA email account or setup email forwarding using this link: http://www.sfasu.edu/mysfa/o365/forwarding-email/

It is important to practice good email communications in college courses. Use “ENGR 1304” in the subject of your email messages. Use complete sentences and capitalization when appropriate. The body of your email messages should begin with your instructor's name and end with your name.

Classroom Policies
Obviously, times are trying and all of the information in this syllabus is subject to change. For our face-to-face meetings I ask you to please comply with the following:

- Wear a mask or face covering over your nose and mouth
- Stay 6 feet away from others in the classroom and in meetings with the instructor

The course may change structure at any point through the semester due to whatever 2021 may bring…

Academic Integrity (4.1)
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

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/student-academic-dishonesty-4.1.pdf

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 course work 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 for the purpose of computing the grade point average.
**Students 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 in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).

**Mental Health and Wellness**
SFA values students’ mental health and the role it plays in academic and overall student success. 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:**
SFA Counseling Services [www.sfasu.edu/counselingservices](http://www.sfasu.edu/counselingservices) Rusk Building, 3rd Floor 936.468.2401

SFA Human Services Counseling Clinic [www.sfasu.edu/humanservices/139.asp](http://www.sfasu.edu/humanservices/139.asp) Human Services, Room 202 936.468.1041

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