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:  EGR 111  Co-Requisites:  None

Credits:  3 Hours  (Lecture:  3 Hours)

Instructor:  Christopher J. Aul

Textbook:  *Introduction to Solid Modeling Using Solidworks 2018*
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.
Instructor: Christopher J. Aul, PhD
Office: 207D Ed & Gwen Cole STEM Building
Office Hours: MW 8-11am, TR 10-11am, or by appointment
Class Meetings: TR 2:00-3:46pm, Room 314 STEM Building
Course Home Page: http://d2l.sfasu.edu
Prerequisites: EGR 111

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.

Text and Materials:

I will be assigning homework directly from the text so it is important that you obtain a copy of this edition. 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>
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</tbody>
</table>

Letter grades are based on the following ranges:
A 90.0 – 100%  B 80.0 - 89.9%  C 70.0 - 79.9%  D 60.0 - 69.9%  F < 60.0%

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).
Course Calendar:
(Calendar is tentative and dates/times are subject to change)

<table>
<thead>
<tr>
<th>Week</th>
<th>Class Dates</th>
<th>Topic</th>
<th>Chapter</th>
<th>Important Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/22/19</td>
<td>Intro to Design using Solidworks (SW)</td>
<td>1</td>
<td></td>
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<tr>
<td>2</td>
<td>1/29/19</td>
<td>Design Basics, Measuring Instruments, CAE Techniques</td>
<td>1</td>
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<tr>
<td>3</td>
<td>2/5/19</td>
<td>Additional CAE Techniques in SW</td>
<td>3</td>
<td>2/4 - Design Selection Due</td>
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<tr>
<td>4</td>
<td>2/12/19</td>
<td>Advanced Modeling in SW, Technical Report Writing</td>
<td>4</td>
<td></td>
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<tr>
<td>5</td>
<td>2/19/19</td>
<td>Parametric Modeling in SW</td>
<td>5</td>
<td></td>
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<tr>
<td>6</td>
<td>2/26/19</td>
<td>Assembly Models, Mating in SW, Exploded Views</td>
<td>6</td>
<td>3/1 - Initial Design Exam Due</td>
</tr>
<tr>
<td>7</td>
<td>3/5/19</td>
<td>Advanced Assembly Options, Interference and Collision</td>
<td>7</td>
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<tr>
<td>8</td>
<td>3/12/19</td>
<td>Engineering Drawings, Dimensioning &amp; Tolerancing</td>
<td>2</td>
<td></td>
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<tr>
<td>9</td>
<td>3/19/19</td>
<td>Spring Break</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>4/2/19</td>
<td>Assembly Drawings, BOM</td>
<td>8</td>
<td>4/5 - Detailed Design Exam Due</td>
</tr>
<tr>
<td>11</td>
<td>4/9/19</td>
<td>Mechanisms in SW, Motion Simulation</td>
<td>11</td>
<td></td>
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<tr>
<td>12</td>
<td>4/16/19</td>
<td>Molds and Sheet Metal Design</td>
<td>12</td>
<td></td>
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<tr>
<td>13</td>
<td>4/23/19</td>
<td>Simulation Techniques, Easter Break</td>
<td>12</td>
<td></td>
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<tr>
<td>14</td>
<td>4/30/19</td>
<td>Basic Static Analysis using SOLIDWORKS</td>
<td>13</td>
<td></td>
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<tr>
<td>15</td>
<td>5/7/19</td>
<td>Weldments</td>
<td></td>
<td></td>
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<tr>
<td>16</td>
<td>5/14/19</td>
<td>Final Presentations during Class</td>
<td></td>
<td></td>
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</table>

In-Class Assignments:
The course will largely be software based using SolidWorks 2018. 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 "EGR 210" 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.

Academic Integrity (A-9.1)
Collaboration on examinations, in class assignments, and homework assignments is forbidden except where specifically specified as "Team" activities. For example, homework assignments can be worked on as a team but must be completed separately. In general, one team may not collaborate with another team on "Team" activities. Students violating this policy will be subject to procedures described in the Stephen F. Austin State University Policies and Procedures Manual.

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/academic_integrity.asp

Withheld Grades Semester Grades Policy (A-54)
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/.
Program Learning Outcomes
These are consistent with the “Student Outcomes” earlier in the syllabus document.

Student Learning Outcomes
These are consistent with the “Course Learning Outcomes” earlier in the syllabus document.

General Education Core Curriculum Objectives/Outcomes (EEO)
This course is not included in the general education core curriculum. Therefore, please see the learning outcomes above rather than any Exemplary Educational Objectives (EEOs).