Engineering 1310 & 1010 – Spring 2024
Geometric Modeling for Mechanical Design
Department of Physics, Engineering, and Astronomy; Stephen F. Austin State University

Instructor: Dan Bruton, PhD
Email: dbruton@sfasu.edu
Office: STEM 102, 113C or 319
Phone: 936-468-2360
Text: 936-666-0902
Office Hours: 12-3pm Mon & Wed or by appointment via www.danbruton.com/meeting
Class Meetings: 4:00-5:40pm Mon & Wed, STEM Building Room 316
Course Home Page: http://d2l.sfasu.edu

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
Introduction to Solid Modeling Using SolidWorks, W. E. Howard & J. C. Musto, McGraw-Hill Education

Homework will be assigned 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

Course Average = 0.75 × (Exam Average) + 0.25 × (Average of Homework and In-Class Assignments)

Letter grades are based on the ranges below.

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<tr>
<th>Grade</th>
<th>Score Range</th>
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<tr>
<td>A</td>
<td>90.0 - 100</td>
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<td>B</td>
<td>80.0 - 89.9</td>
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Exams
There will be four major exams, each covering a limited amount of lecture and text material. The dates of these exams are listed in the course outline attached to this page. Students will have one week after each exam to review the exams and discuss the grades. No make-up exams will be given except in the case of an excused absence. An official written notice is required for an excused absence within three days of the exam. Any makeup exam must be taken within three days of the missed exam. Students who make below a 70 on an exam should visit with the instructor before the next exam.

Homework Assignments
The due dates for each homework assignment will be posted in D2L. Homework will be electronically submitted for grading via D2L. Your homework problems will be of professional quality and professionally presented.

Classroom Policies
For the benefit of your fellow students and your instructor, you are expected to practice common courtesy about all course interactions. For example:

- Be considerate toward your classmates and instructor and arrive to class on time.
- Avoid classroom distractions. Be attentive in class: stay awake, do not browse social media, etc.
- If you are late to class or must leave early, please inform your instructor in advance.
**Academic Integrity (A-9.1)**
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](http://www.sfasu.edu/policies).

**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/](http://www.sfasu.edu/disabilityservices/).

**Mental Health and Wellness**
SFASU 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:
- SFASU Counseling Services
  - www.sfasu.edu/counselingservices
  - 3rd Floor Rusk Building
  - 936-468-2401

SFASU Human Services Counseling Clinic
- 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

**Acceptable Student Behavior**
Classroom behavior should not interfere with the instructor's ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

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

**Email Communication**
All official course communication will be made using your SFA Jacks account. You must use your SFA email account for all communications. You will be notified via your SFA Jacks email account about grades and attendance. It is important to practice good email communications in college courses. Use "PHYS 2325" 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.
**Time Management**
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. A required 150 minutes of asynchronous material will be given to the students throughout the class.

**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
## Spring 2024

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### EXAM 1
- **Chapter 1** Basic Part Modeling Techniques
- **Chapter 3** Additional Part Modeling Techniques
- **Chapter 4** Advanced Part Modeling

### EXAM 2
- **Chapter 5** Parametric Modeling Techniques
- **Chapter 6** Creation of Assembly Models
- **Chapter 7** Advanced Assembly Operations

### EXAM 3
- **Chapter 2** Engineering Drawings
- **Chapter 8** Assembly Drawings
- **Chapter 9** Generation of 2D layouts

### EXAM 4
- **Chapter 10** Solution of Vector Problems
- **Chapter 11** Analysis of Mechanisms
- **Chapter 12** Design of Molds and Sheet Metal Parts
- **Chapter 13** Use of SW to Accelerate PDC

**Final Exam**
- 10:30-12:30
- Engineering 1310
- Spring 2024