Engineering 1301.001 & 1001.021 – Fall 2021
Foundations of Engineering I
Department of Physics, Engineering and Astronomy, Stephen F. Austin State University

Instructor: Dan Bruton, PhD
Email: dbruton@sfasu.edu
Office: STEM 113C or 319
Phone: 936-468-2360
Text: 936-666-0902
Office Hours: 3-4 PM Mon & Wed in STEM 102; 2-4 PM Tue & Thu in STEM 113C or 319; or appt.
Class Meetings: Monday & Wednesday 1:00 - 2:40 PM; STEM Room 103
Course Home Page: https://D2L.sfasu.edu

Course Description
This course is an introduction to the engineering profession, ethics, and disciplines. The course will stress the development of skills in teamwork, problem solving, logic processing, algorithm development, estimation, design, and drawing. There will be an emphasis on computer applications and programming, digital logic, Computer Aided Drafting (CAD) tools, and communication. Topics include Newton's laws, unit conversions, statistics, computers, Excel, basic graphics skills, visualization, and orthographic drawings. Software used: CAD, Windows, Office, and the Internet. (3 semester hours; 2 hours lecture and 2 hours lab per week) Co-Requisite: ENGR 1001 Lab

Text and Materials
*Engineering Fundamentals and Problem Solving*
7th Edition

All other materials required for the course will be communicated to the student on D2L (the course website) throughout the semester.

Grading Policy
Each major exam will be graded on a 100-point scale. The course grade will be computed as shown below.

\[
\text{Course Average} = (0.60E + 0.25H + 0.15T)
\]

where
- E = Exam Average
- H = Average of Homework and In-Class Assignments
- T = Average of Team Projects

Letter grades are based on the ranges below.

- A 90.0 - 100
- B 80.0 - 89.9
- C 70.0 - 79.9
- D 60.0 - 69.9
- F < 60.0

Attendance Policy
Attendance will be taken at the beginning of class and the end of class. It is important to arrive to class on time in order to receive instructions that will enable you to earn full credit on in-class assignments and homework.

Exams
There will be four major exams, each covering a limited amount of lecture and text material. The final exam will not be comprehensive. 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 must visit with instructor before the following exam.
Homework Assignments
All homework assignments are due at end of day (5pm) on the Friday specified unless otherwise stated. Homework will be electronically submitted for grading via D2L. No late homework will be accepted unless you have an excused absence.

In-Class Assignments
All in class assignments must be completed by the end of the class period. It is the discretion of the individual instructor to grant additional time if deemed necessary.

Team Grades
The TEAM must ensure that all members of the team contribute to and understand the contents of team submissions. All team members who participate in an assignment will receive equal credit for that team submission. A grade of zero will be assigned to any member not signing a team submission. Team grades may include team efforts.

Disclaimer: Per SFA policy 5.4, this schedule and chosen exercises reflects that for each credit hour we will have one hour of faculty instruction with at least two hours of out-of-class student work per week. In other words, for an X credit hour class the student should expect X class hours of faculty instruction with 2 times X out-of-class hours of student work per week.

Course Requirements
On average, for ENGR 1301, students should spend 6 hours, or more, per week working outside of class. This time should be spent reading the textbook, working on homework, working on class projects, or studying.

Program Learning Outcomes (PLO) or ABET Student Outcomes (SO)
Graduates of the program will have:

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

Student Learning Outcomes (SLO) or ABET Course Learning Objectives (CLO)
By the end of the course, a successful student will be able to:

1. Describe the variety of collegiate and career opportunities of an engineering discipline. (PLO-4)
2. Evaluate ethical issues related to engineering; formulate and justify position on these issues. (PLO-4)
3. Demonstrate an ability to function on multidisciplinary teams. (PLO-5)
4. Compose clear and concise oral presentations and written descriptions of experiments and projects. (PLO-3)
5. Identify process variability and measurement uncertainty associated with an experimental procedure and interpret the validity of experimental results. (PLO-6)
6. Demonstrate the ability to solve problems by using a standardized approach. (PLO-1)
7. State observations in appropriate units and perform conversions when necessary. (PLO-1)
8. Apply principles from the physical sciences to analyze and solve engineering problems. (PLO-1)
9. Convert units for physical and chemical parameters as required for different system of units. (PLO-1)
10. Identify when a quantity is dimensionless. (PLO-1)
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).

Academic Integrity
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.

Student Academic Dishonesty: Policy 4.1
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/.

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
<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>8/23/2021</td>
<td>Introduction &amp; Teamwork</td>
<td>CH 1</td>
</tr>
<tr>
<td>M</td>
<td>8/30/2021</td>
<td>Education for Engineering</td>
<td>CH 2 &amp; 3</td>
</tr>
<tr>
<td>W</td>
<td>9/1/2021</td>
<td>Introduction to Engineering Design</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>9/6/2021</td>
<td>Introduction to Computer Aided Design (CAD)</td>
<td>CAD</td>
</tr>
<tr>
<td>W</td>
<td>9/8/2021</td>
<td>Design Project</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>9/13/2021</td>
<td>Engineering Solution Procedures</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>9/15/2021</td>
<td><strong>Exam 1 (CH1 - CH4 &amp; CAD)</strong></td>
<td>CH 4</td>
</tr>
<tr>
<td>M</td>
<td>9/20/2021</td>
<td>Representation of Technical Information: Data, Curve Fitting</td>
<td>CH 5</td>
</tr>
<tr>
<td>W</td>
<td>9/22/2021</td>
<td>Empirical Equations: Linear, Power Curves, Exponential Curves</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>9/27/2021</td>
<td>Engineering Measurements: Accuracy, Precision, Sig Figs</td>
<td>CH 6</td>
</tr>
<tr>
<td>W</td>
<td>9/29/2021</td>
<td>Errors and Estimation</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>10/4/2021</td>
<td>Dimensions and Physical Quantities</td>
<td>CH 7</td>
</tr>
<tr>
<td>W</td>
<td>10/6/2021</td>
<td>Units and Conversions</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>10/11/2021</td>
<td>Introduction to Statistics</td>
<td>CH 10</td>
</tr>
<tr>
<td>W</td>
<td>10/13/2021</td>
<td><strong>Exam 2 (CH5 - CH10)</strong></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>10/18/2021</td>
<td>Mechanics: Statics</td>
<td>CH 12</td>
</tr>
<tr>
<td>W</td>
<td>10/20/2021</td>
<td>FBD and Equilibrium</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>10/25/2021</td>
<td>Mechanics: Strength of Materials (Stress and Strain)</td>
<td>CH 13</td>
</tr>
<tr>
<td>W</td>
<td>10/27/2021</td>
<td>Design Stress, Stress Concentration</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>11/1/2021</td>
<td>Energy Sources &amp; Alternatives</td>
<td>CH 15 &amp; 16</td>
</tr>
<tr>
<td>M</td>
<td>11/8/2021</td>
<td>Thermodynamics: 1st &amp; 2nd Laws</td>
<td>CH 16</td>
</tr>
<tr>
<td>W</td>
<td>11/10/2021</td>
<td><strong>Exam 3 (CH12 - CH16)</strong></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>11/15/2021</td>
<td>Introduction to Electrical Theory</td>
<td>CH 17</td>
</tr>
<tr>
<td>W</td>
<td>11/17/2021</td>
<td>Electric Current and Potential</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>11/22/2021</td>
<td><strong>Thanksgiving Holiday</strong></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>11/24/2021</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>11/29/2021</td>
<td>Circuits</td>
<td>CH 17</td>
</tr>
<tr>
<td>W</td>
<td>12/1/2021</td>
<td>Power</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>12/8/2021</td>
<td><strong>Exam 4 (CH 17) (1pm-3pm)</strong></td>
<td></td>
</tr>
</tbody>
</table>