A. COURSE INFORMATION

**Course number/section:** ENGR-1312_001, ENGR-1312_201 (lab)

**Class meeting time:**
- **LEC:** 11:00 A.M. to 12:50 P.M. T
- **LAB:** 11:00 A.M. to 12:50 P.M. R

**Class location:**
EN 316

**Course Website:**
https://bb9.tamucc.edu/webapps/portal/frameset.jsp, then go to the appropriate course section

B. INSTRUCTOR INFORMATION

**Instructor:** Ronald J. Carlson

**Office location:** EN 219

**Office hours:** MW 2:15 to 3:15

**Telephone:** (361) 825-3272

**e-mail:** ronald.carlson@tamucc.edu

**Appointments:** email, call, or visit with instructor to make an appointment

C. COURSE DESCRIPTION

**Catalog Course Description**

Topics include, depending on the major: emphasis on computer applications and programming and solids modeling using CAD tools or other software; fundamentals of engineering science; advanced graphic skills.

**Extended Course Description**

This course will be geared toward communicating effectively through the use of graphical design. The use of 2D and some 3D solid modeling will be used for this objective. Learning how to use the CAD software presented (AutoCAD/Inventor) is important, but the need to follow appropriate principals and standards is of greater importance. The course covers the following topics: introduction to engineering graphics design, 2D/3D visualization; geometric construction; graphical projection, sketching, & dimensioning. A project is assign for students to apply the graphical drawing techniques typical of industry for mechanical drawings.

More advance courses will use what you have learned in this class to further your mechanical engineering knowledge. This knowledge has a direct impact on industry in general.
D. **PREREQUISITES AND COREQUISITES**

**Prerequisites**
ENGR 1211 - Foundations of Engineering I

**Corequisites**
None

E. **REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES**

**Required Textbook(s)**

**Optional Textbook(s) or Other References**
Students will use online resources to supplement the text book.

**Supplies**
Not required, but beneficial: Small Ruler, 30/60/90 triangle

F. **STUDENT LEARNING OUTCOMES AND ASSESSMENT**

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

1. Learn to create drawings using the drafting tools in AutoCAD such as lines, circles, arcs, ellipses, polygons, rectangular and circular arrays.
2. Learn drafting techniques to create orthographic views, and project from one view to another.
3. Learn drafting techniques to create auxiliary views.
4. Learn to dimension a drawing and add tolerances.
5. Learn to create section views.
6. Learn to create 3 dimensional solids using Inventor.
7. Learn to use Inventor to create assemblies from individual solid models, and animate them.
8. Learn to perform finite element analysis using Inventor.
9. Learn to create animated presentation using Inventor.

By the end of this course, students should be able to:
1. Apply the Mechanical Drawing Process on assignments and exams.
2. Use projections, pictorials, orthographic, auxiliary views, and sectional views.
3. Apply drawing standards as is: dimensioning, tolerancing, and geometric tolerances.
4. Develop drawing skills using 2D CAD software.
5. Develop skills using 3D Solid Modeling software.
6. Effective communication through the development of technical drawings and proper presentation of a design project.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

The book is a good source for focus learning so we go over book examples, and then I work on an example usually from the end of the chapter exercises either on the board or computer. After this, students are to work on an exercise and/or homework on your own or group. Students will be tested on the material with quizzes and exams.

Assignments

Lab work will be assigned every week as related to the topics in class. They are to be worked during the lab time and are usually due at the end of lab session; therefore attendance is essential. Late assignments will NOT be accepted; if you have a special circumstance let me know without delay. In the event that you prove (after seeking different sources of help, including instructor) to have difficulty with an assignment, an extension may be obtained from instructor.

Projects

A project will be assigned during the semester. Detail information will be presented and discussed during the semester.

H. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (2)</td>
<td>15 each</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5</td>
</tr>
<tr>
<td>Homework</td>
<td>30</td>
</tr>
<tr>
<td>Project</td>
<td>10</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25</td>
</tr>
<tr>
<td>Other activities . . .</td>
<td></td>
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</tbody>
</table>

Grades will be assigned using the following scale:
A: 100-90, B: 89-80, C: 79-70, D: 69-60, and F: 59-0.
Rubric:
Attendance
Missing more than three (3) classes without prior approval of the professor will result in a 0.5% grade reduction per missed class.

AutoCAD
1. Missing lines – 0.5% per word per line
2. Dimensions missing or incorrect – 0.5% per instance
3. Over-dimensioning – 0.5% per instance
4. Centerlines missing or improper – 0.5% per instance
5. Gaps – either missing, too long or too short. Especially on chamfers and rounds. – 0.25% per instance
6. Alignment of Dimensions, distance from object – 0.25% per instance
7. Extension lines wrong – crossing object Note: it cannot always be avoided – 0.25% per instance
8. Orthographic views out of position – 3%
9. Drawing is an excessive distance from the origin, (>150mm, 6 inches) or not in the +X and +Y quadrant – 50%
10. Other types of errors, mistakes or improper use – varies
11. Section views inaccurate and incomplete – same as a drawing
12. Auxiliary views out of position or alignment in incorrect – 50%

Inventor – Grading to be determined
1. Failure to create shape/object to the proper dimensions
2. Failure to properly dimension
3. Failure to perform FEA
4. Failure to create an assembly
5. Failure to animate an assembly
6. Failure to create a presentation

I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 28</td>
<td>Introduction to CAD</td>
<td>AC 1 &amp; 2</td>
<td>Read chapters 1, 2</td>
</tr>
<tr>
<td>Sep. 4</td>
<td>Introduction to CAD Advanced commands</td>
<td>AC 2, 3 &amp; 4</td>
<td>Read chapters 2, 3, &amp; 4</td>
</tr>
<tr>
<td>Sep. 11</td>
<td>Sketching &amp; Orthographic views</td>
<td>AC 4 &amp; 5</td>
<td>Read chapters 4 &amp; 5</td>
</tr>
<tr>
<td>Sep. 18</td>
<td>Orthographic and Section Views</td>
<td>AC 5 &amp; 6</td>
<td>Read chapter 6</td>
</tr>
<tr>
<td>Sep. 25</td>
<td>Exam 1, Section Views/Aux View</td>
<td>AC 6 &amp; 7</td>
<td>Read chapters 5, 6 &amp; 7</td>
</tr>
</tbody>
</table>
### Oct. 2
3D Solid Modeling
Read chapters 1 – 13

### Oct. 30
Exam 2 Communication Project

### Nov. 20
Dimensioning and tolerances
Read chapters 8 -10

### Nov. 27
Threads, fasteners, working drawings,cams & gears
Read chapter 11 - 13

### Dec. 4
Review

### To be Announced
Final Exam

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**J. COURSE POLICIES**

**Attendance/Tardiness**
Absences are discourage and detrimental to learning and to your grade. However, it is the student's responsibility to obtain class notes, handout materials, etc. when a scheduled lecture is missed. Grading for Attendance will be deducted after the first absence. Starting with the second absence a 1% deduction will apply. If you accumulate 6 absences you have a zero (half a letter grade) for this grading category. Attendance/Tardiness

**Late Work and Make-up Exams**
Late work, scheduled exam absences or No-show on lab/project will not be accepted unless there exists legitimate excuses (illness, death in the immediate family, etc.) and adequate documentation is furnished. If a make-up were to be needed it could be a degree higher in difficulty.

**Cell Phone Use**
Cell phone use is prohibited once class begins. They are to be silenced and put away where they are not seen. If a call is expected take it out of the class. Anyone that interrupts class due to cell phone will be asked to leave.

**Laptop Use**
Laptops may be permitted if used for class work.

**Food in Class**
No food is permitted. Only bottled water with a cap or sealable lid. Failure to comply will result in the student being asked to leave to correct the issue.

**Missed Exam**
You will receive a zero for a missed exam, unless you have accommodations with Instructor or have a legitimate excuse. You are to communicate any issues immediately.
Participation
To be announced in class when extra points are given.

Others
No other policies at this time. Any changes will be announced in class.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. **Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course.** Should dropping the course be the best course of action, you must...
initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  http://disabilityservices.tamucc.edu/

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition,
the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. OTHER INFORMATION

- Academic Advising
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER
I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.