Course Logistics

Laboratory Days and Times
- Monday 5:30-8:20pm Section 01
- Tuesday 5:30-8:20pm Section 02
- Wednesday 5:30-8:20pm Section 03

Location: O’Connell 438

Prerequisites: Co-Requisite MECH 100

Instructors:
- Dr. W.R. Johnson (wrjohnson@csuchico.edu)
  Lecturer
  Office: O’Connell 304
  Office Hours:
  Tu: 11 AM-12 Noon, W: 11 AM--12 Noon, Th: 10 AM--12 Noon
  Phone: 898-5579

- Mr. Alex Ward (alexw@fafco.com)
  Engineering Lead: FAFCO Inc.
  Lecturer
  Office: O’Connell 423
  Office Hours: TBA
  Phone: 898-4960
Course Description and Goals
This course is designed to be an introduction to engineering graphics, which include overviews of the following concepts; orthographic projection, auxiliary views, isometric views, dimensioning, tolerancing, drawing standards, working standards, and solids modeling.

Course Content Objectives
Upon the successful completion of this course, students will gain understanding of:

- Create ANSI standard orthographic drawings with all necessary components in accordance with current industry standards using SolidWorks CAD software.
- Understand the principles of mechanical component design.
- Understand the principles solid modeling.
- Understand the drawing standards for the department.
- Understand the use of dimensioning, tolerancing, and basic GD&T in drawings.
- Understand the principles and connection of design to sustainable engineering and manufacturing.

Student Learning Outcomes
Upon successful completion of this course, students will be able to:

- Develop a working knowledge of the manufacturing, and mechanical design processes.
- Apply ANSI drafting standards in the creation of mechanical drawings using SolidWorks tools.
- Implement the appropriate types and styles of drawing views given the assigned models.
- Illustrate an ability to design a system or component; to meet the assigned needs given environmental, social, political, ethical, health and safety, manufacturability, and sustainability based inputs.
- Understand professional and ethical responsibility.
- Have the ability to communicate effectively both digitally and interpersonally.
- Show an ability to function on multidisciplinary teams.
- Use SolidWorks tools to accurately illustrate design intent.

Course Usage of Blackboard Learn
Copies of the course syllabus and major assignments may be found on Blackboard Learn. You are responsible for regularly checking the online resources, which is accessed through the Chico State Portal at http://portal.csuchico.edu. Support materials for the
course will be provided via the portal and it is expected that you will either have hardcopies or electronic access to the materials during in-class activities.

**Required Texts and Equipment**

**Textbook**


**SolidWorks Software: Purchasing Information**

SolidWorks software is available for use at any time the Lab is not being utilized for another class. It is highly recommended that the students purchase their own copy of SolidWorks via this link: [http://www.solidworks.com/sw/education/student-software-3d-mcad.htm](http://www.solidworks.com/sw/education/student-software-3d-mcad.htm)

In addition to the option to buying a Student license from SolidWorks, CSU Chico has other free options available to students. There is access to SolidWorks via the Virtual Software Library or VSL, which will be discussed in class. This will require the installation of a third party application called CITRIX. More information is available through ITSS at: [https://wiki.csuchico.edu/confluence/display/help/Virtual+Software+Library](https://wiki.csuchico.edu/confluence/display/help/Virtual+Software+Library)

**Equipment**

Digital Calipers – Calipers of moderate quality can be purchased locally at Harbor Freight and online at your favorable online equivalent. It is not necessary to spend over $50.00.

**Classroom Protocol**

It is expected that students are in-class prior to each class, as the class will start promptly at the scheduled time. Any homework class assignments are due at the start of the class and must be submitted in person at the turn in file that will be located at the front of the classroom.

The use of technology is encouraged for in-class coursework and activities, however extra-curricular activities (phone calls, texting, email, web surfing, etc.,) are not allowed during class. Students violating this policy will be asked to leave as they are potentially distracting to their colleagues who are engaged in learning.

**Communication**

If you need to meet or contact the instructors outside of class hours please attend office hours or email wrjohnson@csuchico.edu, or alexw@fafco.com. For lecture-based concerns, it is also suggested that you seek out your lecture instructor for assistance.

In the event that I need to contact the class members for matters between class meetings (schedule, assignment, or class changes, etc.), it will be done via your university
email account linked to the Portal. University policy requires students to monitor campus email accounts and it is suggested that you set up email forwarding if you have another preferred email account.

**Dropping and Adding**
You are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. found [http://www.csuchico.edu/catalog/](http://www.csuchico.edu/catalog/). You should be aware of the new deadlines and penalties for adding and dropping classes.

**Assignments and Grading Policy**
Assignments are due according to the class schedule and are subject to change depending on course progress through the semester. Changes to the schedule will be announced during class or via the communication protocol described above.

Homework assignments are due at the start of the class and can be submitted either digitally or in person. If class has started, work is considered late and late work is not accepted.

Assigned readings or movie viewing are to be completed before class. Class discussion period will be used to review topics covered within the reading, clarify student questions, and expand on the topics through real-world applied examples.

**Course Grade Breakdown:**
- Assignments 50%
- Midterm Exam 20%
- Final Exam 20%
- Final Project 10%
- 100%

**University Policies and Campus Resources**

**Academic integrity**
Students are expected to be familiar with the University’s Academic Integrity Policy. Your own commitment to learning, as evidenced by your enrollment at California State University, Chico, and the University’s Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Judicial Affairs. The policy on academic integrity and other resources related to student conduct can be found at: [http://www.csuchico.edu/sjd/integrity.shtml](http://www.csuchico.edu/sjd/integrity.shtml).
IT Support Services
Computer labs for student use are located on the first and fourth floor of the Meriam Library, Room 116 and 450, Tehama Hall Room 131, and the Bell Memorial Union (BMU) basement. You can get help using your computer from IT Support Services; contact them through their website, http://www.csuchico.edu/itss. Additional labs may be available to students in your department or college.

Student Services
Student services are designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. Students can find support for services such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. Student services information can be found at: http://www.csuchico.edu/current-students.

Americans with Disabilities Act
If you need course adaptations or accommodations because of a disability or chronic illness, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations.

Accessibility Resource Center
http://www.csuchico.edu/arc
530-898-5959
Student Services Center 170
arcdept@csuchico.edu

Student Learning Center
The mission of the Student Learning Center (SLC) is to provide services that will assist CSU, Chico students to become independent learners. The SLC prepares and supports students in their college course work by offering a variety of programs and resources to meet student needs. The SLC facilitates the academic transition and retention of students from high schools and community colleges by providing study strategy information, content subject tutoring, and supplemental instruction. The SLC is online at http://www.csuchico.edu/slc. The University Writing Center has been combined with the Student Learning Center.
General Information

1. Absences are allowed only for illness (doctor’s note required) or other serious reasons with permission prior to the class.
2. All cellular phones should be turned off in the lab.
3. Class announcements regarding tests, class cancellations, etc., will be done via the student WildcatMail email account as required per University policy. If the student has another preferred email provider, the student may set up automatic forwarding of the student WildcatMail to that address via www.csuchico.edu/itss.
4. The student should expect to spend at least 4 hours per week outside of class for lab assignments.
5. All lab CAD assignments must use the department CAD standards for drawings format for title block and Bill of Material table in the drawing. Open the standards in each drawing from the following location: MFGT Faculty\MECH100L_Spring 2015\MMEM Dept Drawing Standards as well as on the Course Student Download located on BBL.
6. If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible.
7. Printing in lab uses GoPrint software. The student must put provide funds with their WildCat card at the bookstore or library kiosk. Printing requires login with Portal account. More information is available at X4357.
8. SolidWorks CAD software will be available on the computers in ONCL 438. The student is expected to login using their portal account identification and password. More information on the portal is available at Update your portal using: http://accounts.ecst.csuchico.edu/
9. Students can work together on CAD assignments, but copying another student’s work is not allowed. University policies, due process, and sanctions for academic dishonesty are followed.
### Schedule: MECH 100, Graphics I, Spring 2017

*(Note: subject to change with fair notice.)*

<table>
<thead>
<tr>
<th>Week</th>
<th>Start Date</th>
<th>Lecture Topic</th>
<th>Activity Assigned</th>
<th>Assignments Due</th>
</tr>
</thead>
</table>
| 1    | 1/23       | **Syllabus, Introduction, Sketches, "What is SolidWorks?"**  
**Concepts Covered:** Movies, First parts, creating sketches, adding geometric relations/ dimensions, Extrusions, Cuts, Fillets, Mirror Features, Hole Wizard, Linear/Circular Patterns, and accessing Lynda.com.  
**Homework Assigned:**  
Software test drive, turn in a block and a disc.  
**In Class Activity:**  
Exhaust Base (Pg 177) |  |  |
| 2    | 1/30       | **Parametric Modeling:**  
**Concepts Covered:** Base feature, Chamfers, rounds, fillets, holes, and other type Features continued. Geometric, dimensional, constraints, and algebraic constraints. | **Homework Assigned:**  
Housing Part File  
Page 273  
**In Class Activity:**  
Connecting Rod Bottom | **Homework Due:**  
Exhaust Base Part File |
| 3    | 2/6        | **Intro to Drawings, "Drawings are a contract"**  
**Concepts Covered:** ANSI Drafting Standards, Department drawing standards, opening and using department drawing templates, BOMs, Revision Blocks, and other basic drawing information. | **Homework Assigned:**  
Housing Drawings  
Page 273  
**In Class Activity:**  
In Class Part and Drawing - Oil Pan Gasket | **Homework Due:**  
Housing Part File |
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<tbody>
<tr>
<td>4</td>
<td>2/13</td>
<td>Assembly Modeling, Mates, and Degrees of Freedom</td>
<td><strong>Homework Assigned:</strong> The Top Cover and Side Cover Parts File Page 87</td>
<td><strong>Homework Due:</strong> Housing Drawings PDF.</td>
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<td><strong>Concepts Covered:</strong> Creating a new assembly, components, sub-assemblies, instances, associativity, hierarchies, assembly constraints, and assembly strategy.</td>
<td><strong>In Class Activity:</strong> Create an Assembly - Connecting Rod - Supply Parts</td>
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<tr>
<td>5</td>
<td>2/22</td>
<td>Assembly Drawings</td>
<td><strong>Homework Assigned:</strong> The Top Cover &amp; Side Cover Drawings Pages 315 – 336,</td>
<td><strong>Homework Due:</strong> The Top Cover &amp; Side Cover Part files.</td>
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<td><strong>Concepts Covered:</strong> Adding the correct part configurations, changing component colors, fasteners and the toolbox, and creating an exploded view, Bill of Materials, and Balloons.</td>
<td><strong>In Class Activity:</strong> Create an Assembly and Drawing - Crankshaft with Bearings</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2/27</td>
<td>Check and Approval Process</td>
<td><strong>Homework Assigned:</strong> Hard Parts: Piston, Engine Block, &amp; Crank Case.</td>
<td><strong>Homework Due:</strong> Top and Side Cover Drawing PDFs.</td>
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<td><strong>Concepts Covered:</strong> Discussion on engineering drawings, the title-block, drawing annotations, and design implementation.</td>
<td><strong>In Class Activity:</strong> Check and Approval Assignment</td>
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<tr>
<td>7</td>
<td>3/6</td>
<td>MIDTERM</td>
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MECH 100 Lab – Spring 2017
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<tbody>
<tr>
<td>8</td>
<td>3/13</td>
<td>Spring Break</td>
<td>Spring Break</td>
<td>WORK ON ENGINE PARTS</td>
</tr>
<tr>
<td>9</td>
<td>3/20</td>
<td><strong>Designing a Part from a set of Requirements</strong></td>
<td>Homework: Worm Gear Part File + Drawing PDF</td>
<td>Homework Due: Hard Parts: Piston, Engine Block, &amp; Crank Case.</td>
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<td></td>
<td><strong>Concepts Covered:</strong> Creating section and auxiliary views in Solidworks.</td>
<td>In Class Activity: Create a Pipe Adapter</td>
<td></td>
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<tr>
<td>10</td>
<td>3/27</td>
<td><strong>Auxiliary, Section, Aligned Section, and Broken out Section Views.</strong></td>
<td>Homework: Challenge Exercises - Worm Gear Shaft + Worm Gear</td>
<td>Homework Due: Worm Gear Part File + Drawing PDF</td>
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<td></td>
<td></td>
<td><strong>Concepts Covered:</strong> Review of Pipe Adapter. Intro to sweeps and swept features. Swept cuts and threading exercise. Lofts, and Wrap Feature: Thin Features, sweeps, fillet options (full round), convert entities, and helix tools.</td>
<td>In Class Activity: Pipe Adapter</td>
<td></td>
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<tr>
<td>11</td>
<td>4/3</td>
<td><strong>Reference Geometry</strong></td>
<td>Homework: Gear Box Final Assembly</td>
<td>Homework Due: Challenge Exercises - Worm Gear Shaft + Worm Gear</td>
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<td><strong>Concepts Covered:</strong> Dimensioning in Solidworks. Driven vs Driving dimensions, and dimensioning options in Solidworks.</td>
<td>In Class Activity: Engine Assembly</td>
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<td>12</td>
<td>4/10</td>
<td><strong>Designing a part from a drawing</strong></td>
<td>Homework: Gear Box and Engine Final Assembly Drawing PDF</td>
<td>Homework Due: Gear Box Final Assembly</td>
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<td><strong>Concepts Covered:</strong> Tolerancing in Solidworks. Implementation of appropriate tolerances given an engineering drawing, and the title block</td>
<td>In Class Activity: Create Crankshaft Part File</td>
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<td>13</td>
<td>4/17</td>
<td>Lofts</td>
<td>Final Project Activity: Identify a part for reverse engineering</td>
<td>Homework Due: Gear Box and Engine Final Assembly Drawings PDF.</td>
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<td></td>
<td>Concepts Covered: Lofts, and Wrap Feature: Thin Features, sweeps, fillet options (full round), convert entities, and helix tools.</td>
<td>In Class Activity: Bottle Tutorials</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>4/23</td>
<td>Configurations</td>
<td>Homework: Design Final Project Parts</td>
<td>Homework Due: Get part approved for final project</td>
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<td>Concepts Covered: GD&amp;T and creation of feature control frames in Solidworks.</td>
<td>In Class Activity: Configuration changes on housing</td>
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<tr>
<td>15</td>
<td>5/1</td>
<td>Revision Control</td>
<td>Homework: Create Final Presentation</td>
<td>Homework Due: None. Work on Final Project.</td>
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<td>After completing the Revision Control assignment, free Lab.</td>
<td>In Class Activity: Rev Control Exercise on Pipe Adapter</td>
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<tr>
<td>16</td>
<td>5/8</td>
<td>DEAD WEEK Free Lab</td>
<td>DEAD WEEK</td>
<td>DEAD WEEK</td>
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<tr>
<td>17</td>
<td>5/15</td>
<td>FINAL EXAM Delivery of Final Project to Instructors</td>
<td>FINAL EXAM</td>
<td>FINAL EXAM</td>
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