

**San José State University**  
**Aerospace Engineering**  
**AE20 Computer-Aided Design for Aerospace Engineers, Fa11 2016**



**Instructor:** Robert Benzio

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**Office Hours:** Tues & Thurs before lab or by appointment

**Class Days/Time:**

|               |                     |           |
|---------------|---------------------|-----------|
| Lecture       | Tues 16:30 - 17:20  | Engr. 339 |
| Lab Section 1 | Tues 18:00 - 20:45  | Engr. 407 |
| Lab Section 2 | Thurs 18:00 - 20:45 | Engr. 407 |

**Classroom:** E339

**Prerequisites:** None

**Faculty Web Page and MYSJSU Messaging**

*Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the [Canvas Learning Management System course login website](http://sjsu.instructure.com) at <http://sjsu.instructure.com>. You are responsible for regularly checking with the messaging system through [MySJSU](http://my.sjsu.edu) at <http://my.sjsu.edu>.*

## Course Description

The course provides an introduction to the fundamentals of drafting and computer-aided design with applications in aircraft and spacecraft design. Students will team up with juniors and seniors to work on aerospace engineering design projects.

## Course Goals

Introduce students to:

1. Technical freehand sketching.
2. Technical drawing.
3. 2D and 3D computer-aided design tools (CATIA, Inventor, or other CAD software available).

## Course Learning Outcomes (CLO)

Students completing the course will be able to:

1. Freehand sketch a 3D view of an object (isometric, oblique and perspective).
2. Draw the standard 2D views (top, front and profile) of an object.
3. Apply simple and complex constrained 2D sketches to create solid features.
4. Construct 3D solid models from sketch geometry using extrusions, revolutions, and sweeps.
5. Create part features such as holes, shells, fillets, chamfers, threads and drafts.
6. Construct and annotate layout drawings.
7. Build basic 3D assemblies with assembly constraints.
8. Layout 3D exploded assembly drawings with balloon labels and a bill of materials parts list.

## Course Relationship to BSAE Program Outcomes

|                            | A   | B   | C | D | E | F | G | H  | I   |
|----------------------------|-----|-----|---|---|---|---|---|----|-----|
| <i>Learning Objectives</i> |     |     |   |   |   |   |   |    |     |
| 1 – 2                      | +   |     |   |   |   |   |   |    |     |
| 3 – 4,                     | ++  |     |   |   |   |   |   |    |     |
| 5                          | +++ | +++ |   |   |   |   |   |    |     |
| 6, 12 – 13                 |     | +++ |   | ✓ | ✓ |   |   | ++ | +++ |
| 7 - 11                     | ++  |     |   |   |   |   |   |    |     |
| 14                         | +++ | +++ | ✓ | ✓ | ✓ |   | ✓ | ++ |     |

+: Skill level 1 or 2 in Bloom's Taxonomy

++: Skill level 3 or 4 in Bloom's Taxonomy

+++ : Skill level 5 or 6 in Bloom's Taxonomy

✓ Skill addressed but not assessed

## Required Texts/Readings

### Textbook

ENGINEERING DRAWING&DESIGN-W/CD  
5<sup>th</sup> ed., CENGAGE Learning,  
David A. Madsen, David P. Madsen  
ISBN: 9781111309572

Other Readings

## Approximate Weekly Schedule

| Week | Topics   |
|------|--|
| 01   | Introduction to CAD                                      |
| 02   | Creating sketches  |
| 03   | Creating parts   |
| 04   | Creating parts continued                                 |
| 05   | Creating features  |
| 06   | Creating features continued                              |
| 07   | Cover basic drafting standards                           |
| 08   | Cover basic drafting standards continued                 |
| 09   | Create drawings  |
| 10   | Create drawings continued                                |
| 11   | Creating assemblies                                      |
| 12   | Creating assemblies continued                            |
| 13   | Creating exploded views                                  |
| 14   | Advanced sketching, constraining and modeling techniques |
| 15   | Advanced sketching, constraining and modeling techniques |
| 16   | Final project due.                                       |

## Course Requirements and Assignments

| Grading of CAD Files                                     |  |  |   |   |   |
|--|--|--|---|---|---|
| CATEGORY   | For an F- 0  | For a D- 1                               | For a C- 2  | For a B- 3                                      | For an A- 4   |
| CAD models   | Models missing or skipped entirely. No evidence of models in file.   | Models poorly created.                   | Models adequately created but with some inaccuracies.         | Models adequately created.                      | Models adequately created with work planes and sketches turned off. Also clean and named features in model tree with minimum features needed and includes; iProperties filed out.( i.e. name, material, part number). |
| CAD Drawings   | No evidence of drawings or cannot open drawing file. No dimensioning | Drawings poorly created. No dimensioning | Drawings adequately created, with some dimensioning.          | Drawings adequately created, with dimensioning. | Drawings adequately created, with correct dimensioning.   |
| CAD Assemblies   | No evidence of assembly or cannot open assembly file.                | Assembly poorly created.                 | Assembly adequately created, but with some inaccuracies.      | Assembly adequately created.                    | Assembly adequately created with all parts and assemblies constrained properly.   |
| CAD Exploded view file (i.e. Inventor Presentation file) | No evidence of exploded view file or cannot open file.               | Exploded view poorly created             | Exploded view adequately created, but with some inaccuracies. | Exploded view adequately created.               | Exploded view adequately created with grouping, order of tweaks, and good spacing for animation.  |

## Grading Information

|                 |                        |     |
|-----------------|------------------------|-----|
| <b>Grading:</b> | Homework + Labs        | 20% |
|                 | Project + Presentation | 20% |
|                 | Midterm Exams          | 30% |
|                 | Final Exam             | 30% |

100 – 97% A+

96 – 93% A

92 – 90% A-

89 – 85% B+

84 – 80% B

79 – 76% B-

75 – 72% C+

71 – 68% C

67 – 64% C-

63 – 61% D+

60 – 57% D

56 – 53% D-

< 53% F. All exams must be taken to receive a passing grade.

## University Policies

*Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>.*

*AE Department and SJSU policies are also posted at <http://ae.sjsu.edu/program-policies>.*