

San José State University
Department of Design / Industrial Design Program
DSID 129, Visualization III, Fall 2018

Instructor:	Prof. Mike Mathe
Office Location:	ART 105
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Office Hours:	By appointment Wednesdays 11:25pm - 2:25pm
Virtual Office Hours:	Thursday / Friday Via skype or hangouts 11:25pm - 2:25pm
Class Days/Time:	Monday & Wednesday 6:00PM - 8:50PM
Classroom:	ART 105
Prerequisites:	DSID 22, DSID 32, BSID or BADS Major
Course Fees:	A percentage of your fees are used in the maintenance of the prototyping facility equipment. The Department of Design requires that Industrial Design students attend and pass the shop safety orientation at least once each year. A shop test date will be reserved within the first two-three weeks of the term. You must provide proof of enrollment and a receipt from the bursar's office that you have paid the required \$20 shop fee to fund #62089 prior to taking the test.

Canvas Course Management Website & Course Format

This course uses a hybrid method of teaching. A hybrid course means that there are components of the course that are done in the classroom and other components that require using the online course management system. The course materials such as the syllabus, assignment handouts, grading, etc. may be found on the DSID 129 course Canvas website. You may find your link to this website on MySJSU, along with your login/password info. You are responsible for regularly checking with the messaging system in Canvas for course updates, assignments, etc. All class correspondence and grading will also be managed through the class Canvas site. If you do not check Canvas often, you should set up your email forwarding to forward all class correspondence to your preferred email address. You must have access to a computer and Internet to be able to access the Canvas site. You may also use a tablet or your phone. ALL assignments will be required to be turned in on Canvas, in which case you will need to have access to some basic software such as MS Office (MS Word) or some writing software, Adobe Acrobat (for making pdfs), and basic scanning software for scanning sketches to upload

to the assignment portal. You will also need to have Solidworks in order to complete the course assignments. See [University Policy F13-2](http://www.sjsu.edu/senate/docs/F13-2.pdf) at <http://www.sjsu.edu/senate/docs/F13-2.pdf> for more details.

Course Description:

Visualization III will focus on developing the students' proficiency in Solidworks, a solids-modeling and surface-modeling CAD tool. By the end of the course, students should feel comfortable with the Solidworks environment and the concepts of parametric, feature-based and history-based modeling. In order to make students comfortable with the concepts that will be introduced, they will often be re-creating projects in CAD that they physically executed in previous foundation courses.

Course Goals:

Course Content Learning Outcomes

This course covers principles of computer graphics, computer-aided technology and applications in industrial design. Emphasis is on the transition from 2D applications to 3D applications. DSID129 Visualization III is divided into nine projects assigned to develop the following skills:

1. Design solid, rectilinear and freeform objects in 3D CAD.
2. Convert previous 2D concepts and renderings into 3D CAD.
3. Visualize and create completely new concepts in 3D CAD.
4. Design assemblies that fit together, without interferences or misalignments.
5. Produce 2D documentation that is controlled by the student's 3D designs.

Course Content Learning Outcomes

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

- LO1. Create solid parts using basic features such as extrusions, cuts, and fillets.
- LO2. Create solid parts using advanced features such as splines, lofts, sweeps, shells, mirrors and patterns.
- LO3. Convert 2D concepts into 3D CAD models.
- LO4. Design parts parametrically, so that they can be easily modified.
- LO5. Plan design work with the aid of layout sketches.
- LO6. Design parts with multiple bodies.
- LO7. Design parts with multiple configurations.
- LO8. Control the design of several parts with the use of a master model.
- LO9. Create assemblies that consist of custom parts and standard, off-the-shelf parts.
- LO10. Design parts to fit together in an assembly without interferences or misalignments.
- LO11. Create dimensioned drawings of solid parts and assemblies.
- LO12. Create photo-renders of parts and assemblies.
- LO13. Diagnose errors and be able to correct them.

Required Materials and Recommended Texts

Required Software

SolidWorks 2017-2017 Student Edition (SE). This is available for download for free from SJSU. Your instructor will get you the information you need to access this.

Acceptable Alternates:

SolidWorks 2017 Premium

Required Computer Hardware

1. Laptop computer capable of running SolidWorks with Windows 7
2. 2GB RAM minimum
3. 15% hard drive space free at all times
4. 3+ button Mouse

Required Textbook

None

Recommended Textbooks

SolidWorks 2013 Bible by Matt Lombard. ISBN: 978-1118508404

or

SolidWorks 2010 Bible by Matt Lombard. ISBN: 978-0470554814

Please note that the 2013 version is expanded and has some videos.

Other suggested materials

1. Lightboard for tracing underlays.
2. Scanner for importing sketches and drawings
3. 5+ Button Mouse with customized buttons (Esc, Backspace, Undo, Control)

Course Fees

Course fees collected for DSID 129 (\$45) will be used to supplement some costs of software for this class and for running the ID Labs and maintaining equipment.

Useful Websites

Solidworks Forum (Official Help Forum) <http://forum.solidworks.com>

3D Content Central (3D Model Bank) <http://www.3dcontentcentral.com/>

Product Design Forums <http://www.productdesignforums.com>

Solid Smack (3D Modeling Blog) <http://www.solidsmack.com>

Engineering Tips (3D CAD Products Forum) <http://www.eng-tips.com>

Core77 (Industrial Design Site) <http://www.core77.com>

Rob Rodriguez (Rendering Expert) <http://www.robodriguez.com>

Solidworks for Industrial Designers (SFSU) <http://www.swxdesign.com>

Dezignstuff (Matt Lombard's website) <http://www.dezignstuff.com/blog>

McMaster Carr (OTS Hardware Vendor) <http://www.mcmaster.com/>

Library Liaison

Monika Lehman, Liaison Librarian for Design Department

Email: Monika.Lehman@sjsu.edu

Phone: 408.808-2657

Classroom Protocol

The most important factor in learning Solidworks is the amount of time spent interacting with the software. It is crucial that the student gain experience in class where questions can be answered and problems averted. Failure to attend class or to focus in class can lead to late nights of panic and frustration. A productive hour in class can often be worth the same as three or four hours of struggling on one's own.

Please be in class at the assigned time. If a student must arrive late or leave early, please do so in a non-disruptive manner and with prior arrangements with the professors for reasonable reasons. If a student is unable to attend class, please email the instructor before class. Do not send messages to the instructor through other students! Excused absences (sickness, etc.) with proof and with prior notice will be accommodated (extensions on tutorials and assignments, where appropriate, etc.).

Students are expected to leave the classroom in a clean condition at the end of each class meeting so that the next class has an organized, clean room waiting for them.

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Assignments and Grading Policy

Tutorials

Students must complete several SolidWorks tutorials, which are designed to help the students gain confidence with certain skills and concepts before they tackle the more challenging projects. Most of the tutorials are supported by detailed instructions, videos, and completed examples, so students should be able to complete them outside of class. However, some time and assistance will be provided in class. To receive credit for a tutorial, the student must present the completed tutorial in class, where the instructor will evaluate it.

Projects

Students will also be assigned several projects throughout the semester. Unlike tutorials, which are “programmed” to always have the same outcome, projects are guided by themes and objectives. Like design projects in other classes, completed projects will be unique for each student. This makes the projects especially challenging, so ample time will be made available in class to work on them. Students are encouraged to take advantage of in-class time to receive help that will be tailored to their specific project issues. Most projects will require some outside-of-class time for completion.

The early projects will be based on assignments previously executed in the Foundation classes (such as the rectilinear, curvilinear and flow form).

The later projects will be part of an interconnected series that will simulate a typical product design, which is usually an amalgamation of custom-designed and off-the-shelf parts. Each project in the sequence will involve the design of a custom bicycle component, such as a seat, bicycle frame or fork. During this period, many of the tutorials will focus on creating additional, standard bicycle components. The project series will culminate with the students assembling a completed CAD model of a bicycle. Each student will submit a unique bicycle assembly with drawings and CAD renderings.

Quizzes

A few quizzes will be given to ensure that students understand certain key concepts and terminology.

Grading Policy

Grading is weighted as follows (percentages are approximate and may be adjusted during the semester):

Tutorials 1-21: 25%

Projects: 1-9: 70%

Quizzes 1-2: 5%

Grading will follow the standard SJSU A-F system.

A+, A, A- / 100+ - 91% / Excellent

B+, B, B- / 90 – 81% / Above Average

C+, C, C- / 80-71% / Average

D / 70-61% / Below Average

F / Below 61% / Failure

Project Due-Dates and Late Policy

- 1. ABSOLUTLY NO LATE WORK WILL BE ACCEPTED FOR ANY REASON.**
- 2. ASSIGNMENTS WILL ONLY BE ACCEPTED THROUGH CANVAS DO NOT EMAIL THEM TO THE INSTRUCTOR.**
- 3. THERE IS NO POSSIBILITY FOR MAKE-UP WORK OR EXTRA CREDIT OF ANY KIND EVER.**

Students are expected to be familiar with the syllabus and to know when projects are due. Tutorials are due in the class session that follows the one in which they were assigned. All assignments are due on time. A passing grade (for receiving university credit for the requirement) in this course is a D-, however, D- project work will usually not pass the DSID 123A Portfolio Project II course.

University Policies

SJSU's Office of Graduate and Undergraduate Programs maintains university-wide policy information relevant to all courses, such as academic integrity, accommodations,

etc. You may find all syllabus related University Policies and resources information listed on [GUP's Syllabus Information Web Page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>.

DSID 129 / Visualization III, Section 01 / Fall 2017, Course Schedule

Schedule is subject to change with fair notice (one week) in class or via notice on Canvas

Week	Date	Topics, Readings, Demos, Assignments, Deadlines, Presentations
1	8/22	<p>Class Introduction: Review of syllabus, course content, assignment structure and deliverables, course expectations. Classroom setup and seating, Power plugs, Hardware and Software setup, Questions from students, get to know everyone.</p> <p>Lecture / Demo: Review Canvas site and discuss video list, tutorials and other instructional materials, working ahead in the class</p>
2	8/27	<p>Lecture / Demo: Staying Organized, Why SolidWorks? Making Real-Things, The Four Driving Principles of SolidWorks, Examples, The SolidWorks Interface, Introduction to Simple Solid Part Construction</p> <p>Assignments:</p> <ol style="list-style-type: none"> 1. P1 Rectilinear (DSID129, Solidworks Project 1, Rectilinear Construction http://youtu.be/yW1d9m32Z7I) 2. T2 SolidWorks Lessons 1 (Parts) & 2 (Assemblies) 3. T3 Introduction to SolidWorks
	8/29	<p>Lecture / Demo: P1.5 Mold design tutorial</p> <p>Assignments:</p> <ol style="list-style-type: none"> 1. Work in class on mold design project <p>Due:</p> <ol style="list-style-type: none"> 1. T2 SolidWorks Lessons 1 (Parts) & 2 (Assemblies) 2. T3 Introduction to SolidWorks
3	9/3	Labor Day (No Class)
	9/5	<p>Lecture / Demo: L1: Relations, Planes 1 (Offsetting Planes), Splines, Parent/Child Relationships</p> <p>Assignments:</p> <ol style="list-style-type: none"> 1. P2 Curvilinear (DSID129, Solidworks Lecture, Creating Sketch Pictures http://youtu.be/Z3kWGCuglgg) 2. T4 Splines (Finish and upload in class) 3. Quiz: Q1 Install the Respondus Lockdown Browser <p>Due:</p> <ol style="list-style-type: none"> 1. P1 Rectilinear

		<ul style="list-style-type: none"> 2. T4 Splines 3. Quiz #1 4. P1.5 Mold design project
4	9/10	<p>Lecture / Demo: L2: Simple Drawings, Sketch Pictures & Layout Sketches</p> <p>Assignment:</p> <ul style="list-style-type: none"> 1. T5 Toy Train 1 (25:52 DSID129, Solidworks Tutorial, Train 1 http://youtu.be/zg2cmvzO4ao) 2. T6 Toy Train 2 (DSID129, Solidworks Tutorial, Train 2 with Layout Sketches http://youtu.be/feeAFKpErks) <p>Due: NA</p>
	9/12	<p>Lecture / Demo: P3 Flowform</p> <p>DSID129, Solidworks Project 3, Flowform http://youtu.be/uhrB_rPkKks</p> <p>Assignments:</p> <ul style="list-style-type: none"> 1. Flow Form 2. Quiz: Q2 Sketch Relations <p>Due:</p> <ul style="list-style-type: none"> 1. P2 Curvilinear
5	9/17	<p>Lecture / Demo: L4: Lofts, Pierce Relation, Projected Curves, Planes 2: Parallel Plane at Point</p> <p>DSID129, Solidworks Lecture, Lofts with Guide Curves http://youtu.be/C18kB35vyvY</p> <p>Assignment:</p> <ul style="list-style-type: none"> 1. T7 Lofts <p>Due:</p> <ul style="list-style-type: none"> 1. T5 Toy Train 1 (25:52 DSID129, Solidworks Tutorial, Train 1 http://youtu.be/zg2cmvzO4ao) 2. T6 Toy Train 2 (DSID129, Solidworks Tutorial, Train 2 with Layout Sketches http://youtu.be/feeAFKpErks) 3. Quiz 2 Sketch Relations
	9/19	<p>Lecture / Demo: L5: Bicycle Geometry</p> <p>Assignment:</p> <ul style="list-style-type: none"> 1. P4 Bicycle Geometry & Concept Sketching <p>DSID129, Solidworks Project 4-1, Bicycle Geometry - Altering Dimensions http://youtu.be/JkAjiEC6C_A</p> <p>DSID129, Solidworks Project 4-2, Bicycle Geometry - Frame Size Selection http://youtu.be/hKr8pWj-hyY</p> <p>Due:</p> <ul style="list-style-type: none"> 1. T7 Lofts 2. P3 Flowform
6	9/24	<p>Lecture / Demo L6: Diagnosing Problems, Planes 3: Controlling Planes with Sketches, Degenerate Points</p> <p>DSID129, Solidworks Lecture, Controlling Evenly Spaced Planes with Sketches http://youtu.be/dh-U8inQ2kU</p>

		<p>DSID129, Solidworks Lecture, Controlling Angled Planes with Sketches http://youtu.be/M1Lgs_ySN-8</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. T8 Troubleshooting 2. T9 Boundaries <p>Due:</p> <ol style="list-style-type: none"> 1. T8 Troubleshooting
	9/26	<p>Lecture / Demo: Dome Tool, Part Construction Strategies, Using SolidWorks as an Ideation Tool</p> <p>Review Sketching in class</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. P5 Sketching 2 2. P5 Bike Saddle <p>DSID129, Solidworks Project 5-1, Bike Saddle - Overview http://youtu.be/ywIL4FNCy5o DSID129, Solidworks Project 5-2, Bike Saddle - Constructing the Seat http://youtu.be/PvHKHz7vkMs DSID129, Solidworks Project 5-3, Bike Saddle - Mounting Rails http://youtu.be/2XfQFDxXWaA</p> <ol style="list-style-type: none"> 3. Quiz 3: Bicycle Terminology <p>Due:</p> <ol style="list-style-type: none"> 1. P4 Bicycle Geometry & Concept Sketching 2. T9 Boundaries
7	10/1	<p>Lecture / Demo: L7: Smooth Tangency, L8: Multiple Bodies, Advanced Boundaries</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. T10 Smooth Tangency 2. T11 Water Jug <p>DSID129, Solidworks Tutorial, Water Jug 1 http://youtu.be/9T_quY416c</p> <p>Due:</p> <ol style="list-style-type: none"> 1. Quiz #3 Bicycle Terminology
	10/3	<p>Lecture / Demo: 3D Sketches</p> <p>Review Sketching in class</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. T12 Handlebar <p>DSID129, Solidworks Tutorial, Handlebars http://youtu.be/lsmSV8oFvjg</p> <ol style="list-style-type: none"> 2. P6 Sketching 3 <p>Due:</p> <ol style="list-style-type: none"> 1. T10 Smooth Tangency 2. T11 Water Jug 3. P5 Sketching 2
	10/8	<p>Lecture / Demo: Simple Sweeps</p>

8		<p>DSID129, Solidworks Lecture, Sweeps with Guide Curves - Part 1 http://youtu.be/9AcCtiRTDZY</p> <p>DSID129, Solidworks Lecture, Sweeps with Guide Curves - Part 2 http://youtu.be/uZ5LzsAGuwk</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. T13 Bottle Cage <p>Due:</p> <ol style="list-style-type: none"> 1. T12 Handlebar
	10/10	<p>Lecture / Demo: Bike Wheel project, Configurations, Troubleshooting bike wheel project</p> <p>Review Sketching in class</p> <p>Due:</p> <ol style="list-style-type: none"> 1. P5 Bike Saddle 2. P6 Sketching 3 <p>Assignment:</p> <ol style="list-style-type: none"> 1. P6 Custom Bike Wheel <p>DSID129, Solidworks Project 6-1a, Bicycle Wheel – Front Hub http://youtu.be/3QfqvPWOKJU</p> <p>DSID129, Solidworks Project 6-1b, Bicycle Wheel – Rear Hub http://youtu.be/zUS8ML_BOfM</p> <p>DSID129, Solidworks Project 6-2, Bicycle Wheel – Rim http://youtu.be/ShfOpyYTL3M</p> <p>DSID129, Solidworks Project 6-3, Bicycle Wheel – Assembling the Parts http://youtu.be/rpllu3oYIFA</p>
9	10/15	<p>Lecture / Demo L10: Patterns, Configurations</p> <p>Due:</p> <ol style="list-style-type: none"> 1. T13 Bottle Cage <p>Assignment:</p> <ol style="list-style-type: none"> 1. T14 Bike Tire 2. T15 Sprocket <p>DSID129, Solidworks Tutorial, Bicycle Sprocket http://youtu.be/6Z7-glogV1U</p>
	10/17	<p>Lecture / Demo: L11: Assemblies and Mating Parts</p> <p>Due: NA</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. T16 Flashlight Assembly 2. P7 Sketching 4
10	10/22	<p>Lecture / Demo: Work in class day, Demo Flashlight</p> <p>Due:</p> <ol style="list-style-type: none"> 1. T16 Flashlight Assembly <p>Assignment:</p> <ol style="list-style-type: none"> 1. keep sketching your bike designs

	10/24	<p>Lecture / Demo: Work in Class Day, Demo Sprocket and Bike tire</p> <p>Due:</p> <ol style="list-style-type: none"> 1. T15 Sprocket 2. T14 Bike Tire <p>Assignment: NA</p>
11	10/29	<p>Lecture / Demo: Bike Stem</p> <p>Due: NA</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. T17 Stem <p>https://www.youtube.com/watch?v=uzWjWfwWtk&feature=youtu.be</p>
	10/31	<p>Lecture / Demo: Bike Fork Project overview</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. P7 Bicycle Fork <p>DSID129, Solidworks Project 7-1, Bicycle Fork – Overview http://youtu.be/wxpc9RU4xcQ</p> <p>DSID129, Solidworks Project 7-2, Bicycle Fork– Inserting the Geometry File http://youtu.be/0awhzwixvQk</p> <p>DSID129, Solidworks Project 7-3, Bicycle Fork – Front Plane Layout http://youtu.be/Zxj2z1d5J9Q</p> <p>DSID129, Solidworks Project 7-4, Bicycle Fork – Tilted Right Layout http://youtu.be/XLpA5rzDLZo</p> <p>DSID129, Solidworks Project 7-5, Bicycle Fork – Creating the Blade http://youtu.be/hZRJo8moD4Y</p> <p>DSID129, Solidworks Project 7-6, Bicycle Fork – Completing the Fork http://youtu.be/NvoMFrE-gh4</p> <p>Due:</p> <ol style="list-style-type: none"> 1. Project 6, Custom Bike Wheel
12	11/5	<p>Lecture / Demo: Hole Wizard</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. Work on Bike fork in class <p>Due:</p> <ol style="list-style-type: none"> 1. T17 Stem
	11/7	<p>Lecture / Demo: L13: Creating Multiple Parts from a Single Part, L14: Advanced Patterns</p> <p>Review Sketching in class</p> <p>Assignment:</p> <ol style="list-style-type: none"> 1. T18 Creating Multiple Parts from a Single Part 2. T19 Handlebar Grips 3. P8 Sketching 5 <p>Due:</p> <ol style="list-style-type: none"> 1. P7 Sketching 4
	11/12	Non-Instructional Day (No Class)

13	11/14	<p>Lecture / Demo: Work in class on Bike fork and sketching Assignment: NA Due:</p> <ol style="list-style-type: none"> 1. T18 Creating Multiple Parts from a Single Part 2. T19 Handlebar Grips
14	11/19	<p>Lecture / Demo: Review Sketching Assignment:</p> <ol style="list-style-type: none"> 1. P8 Bicycle Frame DSID129, Solidworks Project 8-2, Bicycle Frame – Main Layout and Details* http://youtu.be/Y6vSohL4hAE DSID129, Solidworks Project 8-3, Bicycle Frame – Stay Tilted Layouts http://youtu.be/6KIDSyaAklI DSID129, Solidworks Project 8-4, Bicycle Frame – Front Triangle http://youtu.be/0tIT0VDI-C8 DSID129, Solidworks Project 8-5, Bicycle Frame – Rear Triangle http://youtu.be/NMsbDtIVnlk DSID129, Solidworks Project 8-6, Bicycle Frame – Separating the Bodies http://youtu.be/gyttNJOLcsw DSID129, Solidworks Project 8-7, Bicycle Frame – Exploded Assembly http://youtu.be/8q4fOOSOWIA DSID129, Solidworks Project 8-8, Bicycle Frame – Welded Frame http://youtu.be/0eH7v8zsMzE DSID129, Solidworks Project 8-9, Bicycle Frame – Master Model Error http://youtu.be/bVqaDIN07ZM DSID129, Solidworks Project 8-10, Bicycle Frame – Misaligned Master http://youtu.be/l8QbnSScSwE 2. P9 Final <p>Due:</p> <ol style="list-style-type: none"> 1. P7 Bicycle Fork 2. P8 Sketching 5
	11/21	<i>Non-Instructional Day (No Class)</i>
15	11/26	<p>Lecture / Demo: L15: Exploded Views, Downloading Parts from External Sites, L16: Drawings, Multiple Sheets, Adding Annotation, Title Blocks Assignment:</p> <ol style="list-style-type: none"> 1. T20 Exploded View 2. T21 Drawings <p>Due: NA</p>
	11/28	<p>Lecture / Demo: Work in class on Final Assignment: NA Due:</p> <ol style="list-style-type: none"> 1. T20 Exploded View 2. T21 Drawings
16	12/3	<i>In Class Work Day (Optional)</i>
	12/5	<i>In Class Work Day (Optional)</i>
17	12/10	<i>In Class Work Day (Optional)</i>

	12/12	<i>In Class Work Day (Optional)</i>
18	12/17	In Class Final: Monday, December 17th, 6:00pm – 9:00pm Last day to receive help in class
	12/19	Due: 1. P8 Bicycle Frame 2. P9 Final Project