

San José State University
Department of Design / Industrial Design Program
DSID 137, Advanced Prototyping, Section 01, Spring 2019

Instructor:	Prof. Robert Zuchowski
Office Location:	Art 118
Telephone:	Design Department: (408) 924-4346
Email:	robert.zuchowski@sjsu.edu
Office Hours:	F 3:30-4:30pm
Class Days/Time:	F 8:00-11:50am; 12:30-2:50pm
Classroom:	Art 105 (Lecture); Art 103 (Lab)
Prerequisites:	DSID 32; DSID 41 or Instructor Consent

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. Copies of the course materials such as the syllabus, assignment handouts, grading, etc. may be found on the DSID 137 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 the internet to be able to access the Canvas site. You may also use a tablet or your phone. Some 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. 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

This course will introduce a range of different model making techniques throughout the semester that will broaden student awareness and confidence of these processes. In addition to developing precision, craftsmanship and skill through hands-on application of appropriate

various directions and techniques effectively, a great deal of the course will focus on how designers select the most appropriate prototypes for fast effective directions in industry. Therefore, a great deal of emphasis will be placed on the precision, planning, building and communication of design intent to consistently achieve efficient and effective prototypes for various applications.

Course Goals and Student Learning Objectives

Student Learning Objectives

There will be one project in the DSID 137 class this semester. The goal of the project is to create conceptual designs through various fast mockup prototyping to show viability of design direction, then building upon this design direction through sketching/drawing, CAD design, generating and completing a final detailed design, then carefully plan and build a professional-quality appearance model of your design. The primary project will be, design and build a peripheral product that utilizes the computing power, displays and accelerometer capabilities of these devices to create a better application experience than what these devices can offer in their existing form. One of the final deliverables will include a model that accurately fits the phone or tablet you have selected.

Course Learning Outcomes (CLO)

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

- (LO1) Demonstrate “out of the box fast visual thinking”, through fast mockups prototyping techniques and processes, (Looks like works like) for viability of the idea.
- (LO2) Determine effective design directional process through team brainstorming, evolving the idea direction, then presentation and evaluation through formal team critique discussions in positive/negative aspects for improvement, quick human factors study for improved ergonomic aesthetic refinement.
- (LO3) Plan, create 2D and 3D sketches, and experimentation that enables them to explore, formulate and solve design problems and opportunities, build appropriate mockups and prototypes for the various applications Industrial Designers encounter in industry.
- (LO4) Demonstrate self-confidence with uncompromising high professional precision standard for three-dimensional design and prototyping skills, techniques, tools, materials, and craftsmanship.
- (LO5) Exhibit effective use of orthographic projection drawing as a means of developing design concepts that are realistic and functional, specifying accurate dimensioned plans for building appearance prototypes and, communicating their design concepts with accurate dimensions and realistic representations of internal components.
- (LO6) Demonstrate their design awareness, knowledge, and intent, both in their own work and when discussing the work of others in informal classroom discussions and formal critiques at the end of each project. This should be demonstrated in their ability to

actively discuss, critique, and engage in professional review of their work and that of their peers work.

Required Texts/Readings

Textbook

There is no required textbook for this course.

Required Materials List

Everyone's projects will vary in their material demands. There are a mix of required materials and materials that will be determined by your project direction. Cost estimates below represent the average costs that student projects have demanded in the past. The instructor will work with you individually to determine the best material direction for your project.

You should expect to spend approximately \$750-900 in 2D and 3D sketching and model making materials. You need to budget for enough ABS, modulan/renshape, foamcore, foam, paint, double stick tape and other modeling supplies to demonstrate ability in class assignments. Please note that most of your concepts may require additional or specific materials designated/tailored to your conceptual design direction, Those may fall on the specifics like "Soft Goods" (\$45-\$90), "Casting and mold making materials" (\$45-\$95), and "Wood and wood-laminates" (\$50-\$150) This will only be realized once you have conceptual design direction in place. Some sources for these materials, and the cost estimate, are below.

IDSIA Student Chapter: Modulan (High Density Urethane boards)
Size 3"x8"x10", Price for Modulan \$50 - \$65

Other sources:

[IPI Plastics Inc](#): Modulan/Renshape (High Density Urethane boards), \$150
Acrylic, ABS, PETG, need to speak with sales-rep for price on sizes
as there is a huge range in costs based on the type of material.

[Professional Plastics, Inc.](#): PETG Plastic | Clear, Excellent
For Thermoforming: Price Per Sheet, \$55

[McMaster-Carr](#): for all metals, and other things, with free overnight delivery \$50

[Douglas and Sturgess](#): Casting materials, price 2 parts A-B resin quart size, \$35 - \$85

[BJB Enterprises](#): Casting and mold making materials, polyurethane
elastomers, 2 parts A-B resin quart size, price from \$75 - \$90

[Tap Plastics](#) (San Jose): Fiberglass resin \$ 25/qt.

Fiberglass fabric \$20- \$42/yd.

[Britex Fabrics](#) (soft goods materials): Fabric materials, price per sq. yd. \$30 - \$100

[Woodcraft](#): Wood laminates and veneer \$30-150

Shop Test

The Department of Design requires that Industrial Design students attend and pass the shop safety orientation at least once each year. We will be showing the video in class and then you will have at least a week to review the video again on your own as it is posted online (<http://www.sjsu.edu/atn/services/webcasting/events/shopysafety.html>) now. The shop test date will be announced the first day of class. That will be the only date that you will be able to take the shop test for this course so make sure you have studied up and paid your shop test fee at the bursars office before that date. You must provide proof of enrollment and the original receipt from the bursar's office that you have paid the required \$20 shop fee to fund #62089 prior to taking the test.

Library Liaison

Rebecca Kohn, Liaison Librarian for Design Department

Email: Rebecca.Kohn@sjsu.edu

Phone: 408.808-2007

Classroom Protocol

Active participation in class activities is a significant factor in student success in the Industrial Design program. Active learning facilitates mental growth, skill enhancement, creates a lifelong learner, and improves the goals of becoming a good designer. Students are expected to be on time to class and when a class critique is planned, work is to be taped/pinned up to the walls or displayed on the tables by 10 minutes after the official start of the class period. Be ready to start the critique by 15 minutes after the class officially starts. If the student is not on time to class, the work is not pinned up by the time limit, and the student is not ready to begin the critique at the 15-minute mark, the work may not be presented in the critique. Students are to be respectful of the professor and their peers and any disruptive activities in the classroom will result in the student being asked to leave the class. Arriving late to class without prior arrangement and approval from the professor is considered disruptive. If the student cannot be in the classroom by the start of class, please do not interrupt the class in session by entering the classroom. If a student encounters any problems that inhibit their ability to participate in the class, please provide as much advance notice as possible to the instructor so that he/she may respond and inform the student in a timely manner. Students are expected to leave the classroom in a clean condition with all the

desks arranged in the standard configuration at the end of each class meeting so that the next class has an organized, clean room waiting for them.

Cell phones, digital tablets, and laptops are also disruptive and inconsiderate to your classmates and the instructor. Unless it is being used for a class activity, please turn off all electronic devices that can potentially disrupt class. If you disrupt or withdraw from class activities due to your inability to silence and ignore these devices, it will count against the participation portion of your final grade and you will be asked to leave the classroom. If emergency personal issues (family, medical, etc) require you to leave your phone on, you may do so by making arrangements with the instructor in advance. The instructor may need to answer the phone during class due to professional demands or university business, though this will be minimal. Additionally, talking in class during a lecture is considered disruptive to the class, and generally rude, and will adversely affect the participation grade and the student may be asked to leave the classroom.

Assignments and Grading Policy

Students will be engaged in lectures, discussion, design activities, and lab time during class meeting times and they will be assessed on engagement in those activities in their Participation grade. Students will have homework assignments to do outside of class (approx. 12 hours per week) that include sketching, model making, prototyping and other design project activities. You will be required to turn in all projects at the required presentation dates. The final project and project summary booklet must be turned in in a digital format. The digital deliverables will include 3-6 high resolution images of your final model as well as a .pdf format project summary booklet. Grading will follow the standard SJSU A-F system.

All grades are assessed on the following three criteria: Quality, Effort, and Completeness.

- 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

Grading is weighted during the semester as follows:

Class Participation:	20%
Final Project Model:	60%
Final Exam: Project Summary Booklet:	20%

All assignments are due on time. No late work is accepted (this includes work that is required for uploading to Canvas). Extra credit is not possible in this course as the workload is significant enough. The Participation grade in this course will be assessed through your engagement in Work/Activity sessions and critiques each week. Actively engaging and

exhibiting life-long learning skills during class are the mode by which participation is assessed.

University Policies

Academic integrity

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 137 / Advanced Prototyping, Spring 2019 Course Schedule

Schedule is subject to change with fair notice in class or via email notice.

Week	Date	Topics, Readings, Demos, Assignments, Deadlines
1 1/25	F am	<ul style="list-style-type: none"> • Introductions with students • Show my work portfolio to the students, followed with a discussion and Q/A • Show and tell (of one of the projects I worked on) of quick rough mockup and techniques/directions for design and prototyping fast thinking, for a discussion and Q/A leading this to scavenger hunt.
	F pm	<ul style="list-style-type: none"> • Kick off scavenger hunt for artifacts that inspire, may lead in a direction for design concepts, as well as having interesting insights for new ways of holding, clamping, standing, gripping, sliding, latching mechanisms for student's design product.
2 2/1	F am	<ul style="list-style-type: none"> • Creating five design directions, fast rough mockups fashioned from foam and the artifacts that have inspired you, from the scavenger hunt. To show the idea is viable.
	F pm	<ul style="list-style-type: none"> • Each student will be presenting their directional designs 5 fast rough mockups to the class. Leading to brainstorming.
3 2/8	F am	<ul style="list-style-type: none"> • Brainstorming with each student, building/expanding ideas upon the three design directions.
	F pm	<ul style="list-style-type: none"> • Brainstorming continuation with each student, building/expanding ideas upon the three design directions, then evaluating, finally choosing the single best design direction.
4 2/15	F am	<ul style="list-style-type: none"> • Quick presentation with convincing story for the students design direction.
	F pm	<ul style="list-style-type: none"> • Initiating the Design process. (sketching/drawing).
5 2/22	F am	<ul style="list-style-type: none"> • Written short critique of a fellow students design direction, with positive/negative aspects, and how the negative aspects could be improved in that design. (what works and what doesn't work and how you can improve it)
	F pm	<ul style="list-style-type: none"> • Exercise with hand tools, practicing and improving the skills with fine details, on foam.
6 3/1	F am	<ul style="list-style-type: none"> • Repeating this exercise with reshape/modulan. Creating specialized tools for those specific processes, applying them on reshape/modulan (part lines, radiuses and so on)
	F pm	<ul style="list-style-type: none"> • Low fidelity foam volume fast study models. (With continuation and strong focus on each individual design refinements for product through sketching/drawing)

DSID 137 / Advanced Prototyping / Spring 2019 / Prof. Robert Zuchowski

7 3/8	F am	<ul style="list-style-type: none"> •Field trip to IDEO • Initiating Cad design. • Storyboards with team collaboration through brainstorming for further refinements.
	F pm	<ul style="list-style-type: none"> • Preparations and planning for foam models, fast and right methods and approach with shop machine tools and technics.
8 3/15	F am	<ul style="list-style-type: none"> • Creating clean and sharp foam models with the specific focus on finer details.
	F pm	<ul style="list-style-type: none"> • Additional foam mockups iterations, as well as for mechanisms (hinges, holding, clamping, standing, gripping, sliding, latching) to have a better understanding for the final build.
9 3/22	F am	<ul style="list-style-type: none"> • Field trip to Radius design. • Color direction and simple color brakes, painting the foam models.
	F pm	<ul style="list-style-type: none"> • Quick human factors study for improved ergonomic refinement. (through photos, interacting with foam model by family and friends)
Cesar Chavez Day	F 4/1	Cesar Chavez Day, Campus Closed
Spring Break	F 4/5	Spring Break, No Class, Campus Closed
10 4/12	F am	<ul style="list-style-type: none"> • Guiding principles that apply to any model making effort. Planning with right materials, direction and process for visual high end model build, A bill of materials (or BOM) • Kick of visual hard model build.
	F pm	<ul style="list-style-type: none"> • Effective construction and development of the model build, through machine technics, vacuum forming, casting and so on. (dependent on individual students design direction)
11 4/19	F am	<ul style="list-style-type: none"> • Specific focused development for mechanics (hinges, sliding, latching, holding, clamping, gripping, for the high end model)
	F pm	Continuing with development of models.
13 4/26	F am	<ul style="list-style-type: none"> • Painting demonstration, using spray guns, paint mixing ratios with primers and color tinters.
	F pm	<ul style="list-style-type: none"> • Focus on color, and texture finishes direction, for the high end visual model. • Creating (CMF's).
15 5/3	F am/pm	<ul style="list-style-type: none"> • Applying finishing touches. (Fitting/installing all finished parts of the model, with the hardware, peripheral connectors, cables, and portable displays).
16 5/6	Fam/pm	<ul style="list-style-type: none"> • Preparation for final presentation. Creating Project Summary Booklet.

DSID 137 / Advanced Prototyping / Spring 2019 / Prof. Robert Zuchowski

17 5/10	Fam/pm	Final Presentation
Final Exam	M 5/17	7:15pm-9:30am Final Exam/ Project Summary Booklet.