

**San José State University**  
**Department of Design / Industrial Design Program**  
**DSID 128, Advanced Projects in ID, Fall 2018**

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<b>Office Hours:</b>	Fridays from 12:00 – 2:00 ( <i>no drop-ins, please make appointment</i> )
<b>Class Days/Time:</b>	Thursday 3:00pm-8:50pm
<b>Classroom:</b>	Art 205
<b>Prerequisites:</b>	DSID 125A; DSGN 127

### **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. Course materials such as the syllabus, messaging, grading, etc. may be found on the DSID 128 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, 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

Comprehensive, in-depth analysis and design of faculty-assigned projects as well as a student-proposed project. Student proposed projects must meet with the approval of the Industrial Design faculty. Prerequisite: DSID 125A, DSGN 127; BS Industrial Design Majors Only Misc/Lab: Lab 6 hours.

## Course Goals:

### Student Learning Objectives

This course will focus on design methodologies and techniques used by product designers working on complex product design problems in a team environment. It will stress application of all the knowledge you have gained thus far as a student in this program including, but not limited to: design theory, visual presentation, quality and craftsmanship, ergonomics, materials and manufacturing processes used in mass and/or low volume manufacturing processes, mechanical complexity, invention, production techniques, human factors (physical and behavioral), ethnography, user research, detailed design development techniques, sustainable design strategies, sketching, model making, aesthetics principles, and use of a variety of software and hardware tools.

By the end of the class, each student will have conceived, designed and built a unique product design from beginning to end, and will be intimately familiar with the process therein.

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.

### Course Project Deliverables

- 1) **Project Proposal and Research Plan.** Each team must adhere to their Project Proposal and Research plan. The proposal may evolve based upon research input, but the general project direction must be maintained.
- 2) **Project Research Summary Document.** This document summarizes all user interviews, cultural reference/context, functional and technical research, relevant or comparable transport systems, competitive products, empathic research, materials research, etc.

Each Summary Document should conclude with analysis of all research that leads to a clear problem statement and opportunity statement. The problem and opportunity statements shall serve as the basis for your Project Proposal and shall inform your visual design goals and Product Requirements Document (PRD).

- 3) **Product Requirements Document (PRD).** This document outlines all the fundamental requirements of your product from a functional point of view, but also from a user point of view. Requirements such as special features, functions, capabilities, compatibility, capacities, interaction requirements, size, weight, modularity, rechargeability, transformability, agency compliance, and all other design constraints should be clearly spelled out in this document.
- 4) **Final Model BoM (Bill of Materials).** This is an itemized cost summary of all the parts, materials and components that will be required to build your final model for this class. This deliverable should be taken seriously, as the cost of your project will be shared equally between all team members. You can build a great model with a relatively low cost, if you are frugal as a team. Plan your costs realistically and try to put your money where it matters most to the end user experience.
- 5) **Production BoM (Bill of Materials).** This is an itemized cost summary of parts, materials and components that would be required to build a production run of 50,000+ units. This cost summary is extremely important to your team and to the ultimate success of your product (should it go to market). A product that is too expensive or complicated will most likely never find a willing financial backer or manufacturer. Additionally, a product that is too expensive to build will ultimately be too expensive for the end consumer to buy and fail in the marketplace. Consider that a general rule of thumb is that the retail price should be 5X the BoM cost; that is if you intend to make a profit.
- 6) **Drawings.** A minimum of 40 pages per week/per team (8.5" x 11" or larger) filled with sketches during weeks 4-10.
- 7) **Models.** Sketch models and scale mock-ups throughout the semester as part of phase deliverables and weekly investigations.
- 8) **Midterm Presentation.** Midterm Presentation that shows three finalist concept directions with full-scale mock-ups, renders and sketches; each thoroughly vetted through a solid design process.

- 9) **Final 3D Appearance Model.** This full-scale appearance model is to be presented at your final critique. It shall exhibit all fundamental functionality and features (where technically feasible) and be made to look like an actual production unit.
- 10) **Final 3D CAD.** 3D CAD renderings of the product alone (orthographic views plus perspective views) and in-context renderings with product being used or in various states of functionality.
- 11) **Clear Communication of Functions.** Any functionality, capability, or “state changes” that are not evident in the Final 3D Appearance Model must be demonstrated through 3D CAD animations, movies, highly refined storyboards, or other methods, to clearly communicate their function and benefit.
- 12) **Final Presentation.** A final visual presentation (BOTH digital and hard copy on the wall) will take place during the last two weeks of class.
- 13) **Process Book.** A digital process book, well organized, well crafted, and with a Table of Contents, Section Dividers, and submitted at the Final Exam date.
- 14) **Upload to Canvas.** Certain assignments will be uploaded to Canvas during the semester, including work presented on the final presentation, the process book, and any other relevant work related to the project.

## **Required Texts/Readings**

### **Textbook**

The required textbook for this class is: N/A

### **Design Materials**

Materials that will be required for this course will vary depending upon your specific project, but generally will include the following:

- One ream (500 sheets) of copy paper (letter or tabloid size).

- Various mock-up materials, such as: foam core, cardboard, plywood, fabric, wooden dowel, aluminum rod or channel, various fasteners, tape, glue, string, etc.
- Higher density materials such as urethane foam, reshape, or casting materials for the final model.
- 3D Printer consumables will be provided up to 3 cubic inches of volume.
- Plastics (acrylic, styrene, polycarbonate, PVC, etc.).
- Pens, pencils, measuring tools for working in shop.
- Standard set of drill bits for working in shop.
- Paint.
- Ink cartridges for printing.
- A variety of functional prototyping materials that may include: batteries, wiring, soldering equipment, lighting, wheels, bearings, cables, springs, locks, etc.

### **Shop Test**

The Department of Design requires that Industrial Design students attend and pass the shop safety orientation at least once each year. You are responsible for viewing the [Shop Safety Video](#) on your own as it is posted online. The shop test date will be announced the first day of class and will be listed on the syllabus. 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**

Elisabeth Thomas, Liaison Librarian for Design Department

Email: [elisabeth.thomas@sjsu.edu](mailto:elisabeth.thomas@sjsu.edu)

Phone: (408) 808-2193

## Classroom Protocol

Active participation in class activities is a significant factor in a student's success in the Industrial Design program. Active learning facilitates mental growth, skill enhancement, creates a life long 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 by 10 minutes after the official start of the class as we will make all efforts to begin the critique at that point. Arriving late to class without prior arrangement and approval from the professor is considered disruptive. 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 may respond and inform the student in a timely manner. 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. 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.

Cell phones, tablets, and even laptops can be 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. **Phones are NOT permitted in this class** and you will be asked to turn off and store your phone at the start of each class. If you disrupt or withdraw from class activities due to your inability to silence and ignore any of these devices, it will count against the participation portion of your final grade and you may be asked to leave the classroom. Additionally, talking in class during a lecture or critique is considered disruptive to the class and will adversely affect the participation grade and you may be asked to leave the classroom. If emergency personal issues (documented family, medical, etc) require you to leave your phone on, please make arrangements with the instructor prior to and *in advance* of the start of class.

## Assignments and Grading Policy

Students will be engaged in lectures, research and 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 (at least 12 hours per week) that include researching, sketching, building physical models, 3D CAD and more. Students will be graded according to their personal contribution in these areas. Students will be required to turn in a Mid-term Presentation, along with keeping up to date on uploading all assignments to Canvas for grade assessment. You will be required to turn in your final project on the final presentation date. The assigned final will be the turning in of your project

process book AND your project laid out in presentation format during the Final Presentation. Grading will follow the standard SJSU A-F system.

All grades are assessed on the following three criteria: Quality, Effort, and Completeness. Each assignment, presentation and deliverable will be graded on these three criteria, with each criteria holding equal value (33.33%).

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

Each student's grade will be a mix of 50% individual performance and 50% team performance (as specified below), so good teamwork will pay off. Grading will be weighted during the semester as follows:

(Individual) Class Participation, Attendance, Punctuality	15%
(Individual) Contribution to Team's Project Work	20%
(Individual) Contribution Research and Concept Presentation	15%
(Team) Midterm Presentation and Deliverables	20%
(Team) Final Project Presentation and Project Deliverables	20%
(Team) Process Book	10%

All assignments are due on time. **No late work is accepted without documented justification.** If you miss the Canvas deadline for uploading a project deliverable or an in-class deliverable, you will receive a failing grade for that deliverable, however you will still receive feedback on the submission, but only at the next available time that the professor has. Project work for in-class critiques must be 100% complete and pinned up on time in order to receive in-class feedback and anything more than a failing grade. 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 Activities/Exercise sessions, discussions in class, online engagement through Canvas, and critiques. Actively engaging and exhibiting life-long learning skills during class are the mode by which participation is assessed.

### Student Technology Resources

It is a requirement for ID students to have their own computer with the required software (Adobe CS, Solidworks, MS Office). A wide variety of audio-visual equipment is available for student checkout from [Media Services](#) located in IRC 112. These items include digital and VHS camcorders, VHS

and Beta video players, 16 mm, slide, overhead, DVD, CD, and audiotape players, sound systems, wireless microphones, projection screens and monitors.

Adobe Creative Suite licenses are available through the SJSU Adobe software program for faculty, staff, and students. Students can access Adobe Creative Suite 6 Design and Web Premium, and should be able to download it from <http://its.sjsu.edu/services/software/adobe/index.html>.

For access to a Solidworks License, send an email to the professor of this course or your Major Advisor, from the email address you wish to have the license listed under, and the professor will email you the instructions within 48 hours.

### **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 128 / Advanced Projects in ID / Fall 2017

### Course Schedule

*Schedule is subject to change with fair notice (one class period) in class or via Canvas.*

Week	Date	Topics, Assignments, Deadlines
1	8/23	<p><b>Project Kickoff + Research Phase</b></p> <ul style="list-style-type: none"> <li>• Instructor/class introductions</li> <li>• Project Theme</li> <li>• Review syllabus, course expectations, project deliverables and requirements, admin issues, and grading criteria</li> <li>• Begin researching target use cases and user groups</li> <li>• Begin Process Book</li> </ul> <p><b>Lecture/Discussion:</b> Project Theme &amp; Design Research  <b>Activity:</b> Individual reviews with instructor and each team to discuss their project.  <b>Assignment #1:</b> Project Goal and Research plan.</p>
2	8/30	<p><b>Research Phase – Field Interviews</b></p> <ul style="list-style-type: none"> <li>• Team work session to plan/coordinate at least 6 user research interviews, etc.</li> <li>• Continue researching target use cases and user groups</li> <li>• Update Process Book</li> </ul> <p><b>No Lecture</b>  <b>Activity:</b> Instructor will meet with each team to discuss revised proposals and initial research findings.  <b>Due in class:</b> Assignment #1</p>
3	9/6	<p><b>Research Phase – Target Use Case</b></p> <ul style="list-style-type: none"> <li>• Studio team work session to organize research findings and narrow in on final problem/opportunity statement, use case scenarios and design requirements.</li> <li>• Schedule additional interviews, as needed</li> <li>• Establish a team mentor</li> <li>• Update Process Book</li> </ul> <p><b>Lecture/Discussion:</b> Teamwork in Design  <b>Activity:</b> Instructor to meet with each team to review interview progress and problem/opportunity hypotheses.  <b>Assignment #2:</b> Research Interviews Summary/Conclusions - Due 9/12 on Canvas.</p>

<p><b>4</b></p>	<p>9/13</p>	<p><b>Concept Ideation (Week 1)</b></p> <ul style="list-style-type: none"> <li>• Team brainstorm to kick off concept ideation based upon research findings, use cases, problem/opportunity statement. Bring drawing materials to class!</li> <li>• Update Process Book</li> </ul> <p><b>Lecture and Discussion:</b> Concept ideation approach, techniques and presentation method. What is a PRD?</p> <p><b>Activity:</b> Instructor to meet with each team during brainstorming activities.</p> <p><b>Due on Canvas (on 9/12):</b> Assignment #2</p> <p><b>Assignment #3:</b> Create Product Requirements Document (PRD) on Canvas on 9/19</p> <p><b>Assignment #4:</b> Each team member to create at least 15 unique product concepts (shown in multiple views) that address the problem statement. Due 9/20 at the beginning of class.</p>
<p><b>5</b></p>	<p>9/20</p>	<p><b>Concept Ideation (Week 2)</b></p> <ul style="list-style-type: none"> <li>• Individual teams to present and critique one another's concepts. Are there common themes? Which concepts are working well, which are not working? Which concepts support the Problem/Opportunity Statement best? Merge concepts where possible. Establish distinct categories and continue to explore.</li> <li>• Review progress with Mentor</li> <li>• Update Process Book</li> </ul> <p><b>No Lecture</b></p> <p><b>Activity:</b> Instructor to individually review product concepts with each team and help with creation/refinement of concept categories.</p> <p><b>Due on Canvas (on 9/19):</b> Assignment #3</p> <p><b>Due in class:</b> Assignment #4</p> <p><b>Assignment #5:</b> Each team member to create 3 (new or significantly evolved) concepts that are well-considered and shown in multiple views. Each concept should be accompanied by full-scale, physical sketch models. Due 9/27 at the beginning of class.</p>
<p><b>6</b></p>	<p>9/27</p>	<p><b>Concept Ideation (Week 3) – Class Critique</b></p> <ul style="list-style-type: none"> <li>• Each team will present 6 concepts to the entire class in an organized critique setting. After the critique, each team will evaluate their concepts – which concepts best support the problem/opportunity statement and provide the best user experience? Narrow down to 3 finalist concepts.</li> <li>• Begin 3D CAD investigations for 3 concepts</li> <li>• Hand sketch/detail development for each concept</li> <li>• Explore final 3 concepts in physical mock-ups</li> </ul>

		<ul style="list-style-type: none"> <li>• Update Process Book</li> </ul> <p><b>No Lecture</b></p> <ul style="list-style-type: none"> <li>• <b>Activity:</b> Each team will present their concepts to the entire class during a “group critique”. The class will help with evaluating concepts and down-selecting to 3 final concepts to present at MIDTERM. All work must be ready to share at the beginning of class, and teams must be ready to give their full attention during class. , and should not be finalizing presentation materials.</li> </ul> <p><b>Due in class:</b> Assignment #5  <b>Assignment #6:</b> Each team to refine 3 final concepts. Each concept should be represented in full-scale mock-ups, detailed drawings and preliminary CAD renderings. Due 10/3</p>
7	10/4	<p><b>MIDTERM Preparation</b></p> <ul style="list-style-type: none"> <li>• Refine 3 final concepts</li> <li>• Refine user experience</li> <li>• Refine functional aspects</li> <li>• Refine ergonomics</li> <li>• Refine visual design/aesthetics</li> <li>• Create explanatory posters for each concept</li> <li>• Build 3 dimensional (physical) prototypes of all concepts</li> <li>• Update Process Book</li> </ul> <p><b>Lecture and Discussion:</b> Concept Presentation  <b>Activity:</b> Instructor will meet with each team separately to review pre-Midterm progress and give feedback.  <b>Due in class:</b> Assignment #6</p>
8	10/11	<p><b>MIDTERM PRESENTATION - CRITIQUE</b></p> <ul style="list-style-type: none"> <li>• Each team to present their 3 preliminary concepts with full-scale prototypes, functional detail mock-ups, explanatory posters, CAD renderings and support drawings. All presentations shall portray process-to-date from initial research to current mock-up. Projects must be presented in an organized manner that clearly demonstrates the design intention. Each team will have 10 minutes to present and 30 minutes for classmate/instructor/guest feedback.</li> </ul> <p><b>Note:</b> <i>This presentation will include guests from the local design community, and so it is very important that each team is well prepared to present, and well rested enough to represent their ideas and comprehend valuable feedback.</i></p>

		<p><b>Assignment #7:</b> Each team to select a final concept based upon MIDTERM feedback. Explore/refine their final design concept with regard to user experience, aesthetics, functionality, structure, visual proportions, ergonomics, etc. Due 10/18 in class.</p>
9	10/18	<p><b>Concept Refinement</b></p> <ul style="list-style-type: none"> <li>• Each team to refine all design details of their final concept. All details pertaining to architecture, structure, visual proportions, visual design language, user interaction, dimensions, colors, materials, hardware, graphics, etc. shall be determined and represented through a combination of CAD renderings and hand sketches.</li> <li>• Develop Final CAD database of the design.</li> <li>• Build full-scale mock-ups that demonstrate the fundamental design principles, functional attributes, and visual design aesthetic (can be inexpensive materials, but craftsmanship and accuracy should be at a high level).</li> <li>• Update Process Book</li> </ul> <p><b>Lecture:</b> TBD  <b>Activity:</b> Instructor to meet with individual teams and review progress.  <b>Due in class:</b> Assignment #7</p>
10	10/25	<p><b>Concept Refinement, Model BoM and Model Plan</b></p> <ul style="list-style-type: none"> <li>• Revise design as needed, per Midterm feedback.</li> <li>• Make functional or ergonomic improvements that were learned through interaction with the Midterm mock-up.</li> <li>• Complete Final CAD database</li> <li>• Create Bill of Materials (BoM) for final functional appearance model.</li> <li>• Begin planning final “full scale” functional appearance model</li> <li>• Update Process Book</li> </ul> <p><b>Lecture:</b> TBD  <b>Activity:</b> Instructor to meet with individual teams and review progress  <b>Assignment #8:</b> Create Model BoM and upload to Canvas on 10/31</p>
11	11/1	<p><b>Build</b></p> <ul style="list-style-type: none"> <li>• Build final “full scale” functional appearance model</li> <li>• Update Process Book</li> </ul> <p><b>Lecture:</b> TBD  <b>Activity:</b> Instructor to meet with individual teams and review progress  <b>Due on Canvas (on 10/31):</b> Assignment #8</p>

<b>12</b>	11/8	<p><b>Build</b></p> <ul style="list-style-type: none"> <li>• Build final “full scale” functional appearance model</li> <li>• Update Process Book</li> </ul> <p><b>Lecture:</b> TBD  <b>Activity:</b> Instructor to meet with individual teams and review progress</p>
<b>13</b>	11/15	<p><b>Build</b></p> <ul style="list-style-type: none"> <li>• Build final “full scale” functional appearance model</li> <li>• Continue creating final presentation materials i.e. renders, storyboards, info-graphics, charts, user profile, Presentation Board, etc...</li> <li>• Create Production BoM</li> <li>• Update Process Book</li> </ul> <p><b>Lecture:</b> TBD  <b>Activity:</b> Instructor to meet with individual teams and review progress  <b>Assignment #9:</b> Create Production BoM and upload to Canvas on 11/28</p>
<b>14</b>	11/22	<p><b>No Class</b> – Thanksgiving Holiday          (Continue project work as time permits...renders, BoM, Process Book, etc.)</p>
<b>15</b>	11/29	<p><b>Finish Build - Documentation</b></p> <ul style="list-style-type: none"> <li>• Complete final details on final model</li> <li>• Take photos of model, as needed</li> <li>• Finish all presentation materials</li> <li>• Finish Presentation Board</li> <li>• Finish process book</li> </ul> <p><b>No Lecture</b>  <b>Activity:</b> Instructor to meet with individual teams and review progress  <b>Due on Canvas (on 11/28):</b> Assignment #9</p>
<b>16</b>	12/6	<p><b>FINAL PRESENTATION</b></p> <p><b>Due in class:</b> Final Project Presentation  <b>Assignment 10:</b> Process Book (spiral bound hard copy and uploaded pdf to Canvas).</p>
<b>Final Class</b>	12/13	<p><b>Final Class:</b> 3:00 – 7:00          Final Class to review Final Process Books and discuss the semester overall.</p> <p><b>Due in class and on Canvas:</b> Assignment 10</p>