

**USC Iovine and
Young Academy**
*Arts, Technology and the Business
of Innovation*

ACAD 345: Designing Products 2

Units: 4
Spring 2022
Tues./Thurs.
2:00-4:50pm

Location:

Iovine and Young Hall
3780 Watt Way
Los Angeles, 90089
Room: IYH 112

Instructor:

Grant Delgatty
Office Hours: TBD / Call or email for appointment
Contact Info:
delgatty@usc.edu
mobile - 818.378.2736

IT Help:

<https://uscedu.sharepoint.com/sites/IYASStudent/SitePages/IT-Resources.aspx>

Hours of Service: 9 a.m. – 6 p.m.

Contact Info: iyahelp@usc.edu

USC Technology Support Links

[Zoom information for students](#)

[Blackboard help for students](#)

[Software available to USC Campus](#)

Course Description

ACAD 345: Designing Products 2 is an intensive look at the process of bringing a product from concept to market. Includes theory and applied techniques for both physical and virtual products.

Learning Objectives and Outcomes

Students will learn the processes, tools, and techniques for envisioning, designing, and marketing products. Through discussion and application students will garner an understanding of the steps required to design and launch physical products through market and human centered design research, iterative low and medium/high fidelity prototyping, consumer testing, proof of concept validation, and final design execution.

Course Notes

ACAD 345: Designing Products 2 is primarily a hands-on consumer product studio with a significant amount of physical prototyping work being done by students in the Creator Studio during class time. The goal of this class is to design and develop a consumer product that is desirable, feasible and viable, with the final deliverable being a high-fidelity model that in most cases, will be a 'looks like, works like' prototype of the final design. Getting to this point of creating a high-fidelity model, however, will involve multiple iterations of solutions using a 'human centered design' approach to vetting and validating potential product solutions.

Communication

Unless otherwise specified, all instruction will be given in-person during class. It is expected that if a student is late or absent from a class, that the student shall follow-up with the professor to determine what information was covered.

USC Technology Rental Program

The university realizes that attending classes online and completing coursework remotely requires access to technology that not all students possess. If you need resources to successfully participate in your classes, such as a laptop or internet hotspot, you may be eligible for the university's equipment rental program. To apply, please submit an [USC Technology Rental Program Application](#).

HOW TO PURCHASE SOFTWARE AT THE DISCOUNTED ACADEMY RATE

For classes that require them, the following software are available for purchase **online** through the USC Iovine and Young software catalog at the Academy discounted rate:

| Software | IYA Short-Term License at USC Bookstore |
|----------------------|---|
| Adobe Creative Cloud | \$70 2019–2020 annual license |
| Apple Logic Pro | \$35 semester licenses |
| Solidworks | \$35 semester license |

| | |
|----------------------------|-----------------------|
| Apple Final Cut Pro | \$35 semester license |
|----------------------------|-----------------------|

To purchase:

- Visit: <https://commerce.cashnet.com/IOVINE>
- Select the software license(s) you would like to purchase by clicking “View Details” or the software title, and make your purchase
- You will receive an order confirmation receipt at the email address you provided
- You will be notified by email when the software license has been activated

If you have any questions about this process, please do not hesitate to contact Academy IT Support at iyahelp@usc.edu.

Suggested Readings and Supplementary Materials

Product Design and Development (6th Edition), *McGraw Hill*. Steven Eppinger and Karl Ulrich
Prototyping and Modelmaking for Product Design, *Laurence King Publishing*. Bjarki Hallgrímsson

Description and Assessment of Assignments

Weekly homework assignments will be submitted digitally and/or presented, with feedback being provided as critique from both the instructor and fellow classmates. For the duration of the class, students will work towards developing a final product solution they have identified as having opportunity for innovation, and through this process, will be expected to collaborate with other students. Class time may consist of the entire class collectively participating in large group discussions and critiques or may be broken out to have in-class studio time while the instructor gives individual feedback.

Students are responsible for all assignments, including homework, in-class work, critiques, presentations, demos, readings, process documentation, asynchronous work and archiving the team’s progress. It is the student’s responsibility to obtain missed work and information missed if absent. As ACAD 345 is a studio-based class, information is exchanged in group discussion and may not be imparted through handouts or notes, therefore it is critical for students to attend class and be on time to succeed.

Grading Breakdown

Projects will be graded based on adherence to given guidelines, attention to craft and overall appropriateness. Taking initiative, progression and follow-through will also be considered. Both giving and receiving feedback will be critical to your success in the class; therefore, your participation grade is based on your active involvement in class and critiques. Assignments will be docked one full letter grade each week they are late. Absence is not an excuse for late work. Please be sure to communicate with the professor if you miss (or plan to miss) a class to arrange for homework submission.

Grades will be assigned according to a point system based on the following criteria:

- Competency in key concepts
- Effort/range of exploration
- Process and methodology
- Presentation/craftsmanship
- Participation in critique

A **Exceptional** - Going above and beyond with exemplary work both quantitatively and qualitatively.

A- **Excellent** – Meeting all homework requirements with a very high quality of what’s expected regarding content, creativity, attention to detail and craftsmanship.

B+ **Very good** - Completing all assignments with a high level of proficiency but lacking in some areas of competency.

- B Good** - Completing assignments with an above adequate to adequate level of proficiency in the five areas of competency.
- B- Satisfactory** - Completing assignments with a satisfactory level of proficiency in most areas of competency, and below adequate in some areas.
- C+ Unsatisfactory** - Improvement needed in the five areas of competency listed in the grading criteria.
- C Below expectation** - Most likely caused by poor levels of execution, lack of participation incomplete work, and overall lack of performance/effort.
- C- Well below expectation.**
- D Significantly below expectation.**

| Assignments | Points | % of Grade |
|--|---------------|-------------------|
| Market Research: market trends, target consumer, consumer insights | 100 | 5% |
| Initial Ideation: brainstorming, initial concept sketches and concept revision based on user feedback | 400 | 20% |
| Competitor Research competitive analysis, blue ocean strategy, problem/opportunity statements, design criteria | 100 | 5% |
| Midterm Presentation | 200 | 10% |
| Design Revision - concept revisions, prototypes and proof of concept exploration based on user feedback | 300 | 15% |
| Final Design - aesthetic, drawings, renderings | 200 | 10% |
| Final Model - function, craftsmanship, form, ergonomics | 200 | 10% |
| Final Presentation | 300 | 15% |
| Sell Sheet | 100 | 5% |
| Class Participation | 100 | 5% |
| TOTAL | 2000 | 100% |

Grading Scale

Course final grades will be determined using the following scale

| | |
|----------|----------|
| 95 – 100 | A = 4.0 |
| 90 – 94 | A- = 3.7 |
| 85 – 89 | B+ = 3.3 |
| 80 – 84 | B = 3.0 |
| 75 – 79 | B- = 2.7 |
| 70 – 74 | C+ = 2.3 |
| 65 – 69 | C = 2.0 |
| 60 – 64 | C- = 1.7 |
| 55 – 59 | D = 1.0 |
| 0 – 55 | F |

Assignment Submission and Rubric Policy

Unless otherwise noted, all assignments must be submitted either on the Miro virtual whiteboard or as a PDF presentation. For assignments delivered in class (such as presentations), the work must be completed before the commencement of the class session in which the assignment is due.

Grading Timeline

Grades and feedback for all assignments will be returned to students within one week of submission.

Academy Attendance Policy

The Academy maintains rigorous academic standards for its students and on-time attendance at all class meetings is expected. Each student will be allowed two excused absences over the course of the semester for which no explanation is required. Students are admonished to not waste excused absences on non-critical issues, and to use them carefully for illness or other issues that may arise unexpectedly. Except in the case of prolonged illness or other serious issue (see below), no additional absences will be excused. Each unexcused absence will result in the lowering of the final grade by $\frac{1}{3}$ of a grade (e.g., an A will be lowered to A-, and A- will be lowered to a B+, etc.). In addition, being tardy to class will count as one-third of an absence. Three tardies will equal a full course absence.

Students remain responsible for any missed work from excused or unexcused absences. Immediately following an absence, students should contact the instructor to obtain missed assignments or lecture notes and to confirm new deadlines or due dates. Extensions or other accommodations are at the discretion of the instructor.

Automatically excused absences normally may not be used for quiz, exam or presentation days. Using an excused absence for a quiz, exam or presentation, such as in the case of sudden illness or other emergency, is at the discretion of the instructor.

In the case of prolonged illness, family emergencies, or other unforeseen serious issues, the student should contact the instructor to arrange for accommodation. Accommodation may also be made for essential professional or career-related events or opportunities. Additionally, students who need accommodations for religious observations should provide advanced notice to instructors and student athletes should provide Travel Request Letters. All accommodations remain at the discretion of the instructor, and appropriate documentation may be required.

Fall 2022 addendum:

- Unless students provide an accommodation letter from USC's Office of Student Accessibility Services (OSAS) or a letter from IYA Student Services detailing visa or travel restrictions, attendance and active participation is expected in the classroom. Any student with such accommodations should submit their accommodation document to the instructor as soon as possible to discuss appropriate accommodations. Either classroom recordings or live remote access to the class via Zoom will be provided.
- Students who are experiencing illness should not attend class in person. Please inform the instructor in advance of any class sessions that you can't attend for medical reasons, and accommodations will be arranged to view recorded lectures and submit alternatives to any missed class participation. Students will not be penalized for not attending class in person under these circumstances.
- In the event that you find yourself experiencing COVID-19 related symptoms, in keeping with university recommendations, you should Stay home! This is the best way to prevent spreading COVID-19 as supported by scientific evidence; Please do not come to an in-person class if you are feeling ill, particularly if you are experiencing symptoms of COVID-19.

Iovine and Young Hall Cleanout

The Academy is unable to store student projects and materials beyond the end of the semester. Students must remove all projects and personal materials from the Creators Studio, lockers/locker room, and other classrooms by the end of each semester. **All projects and materials left in Iovine and Young Hall will be discarded two days after final exams end. No exceptions.**

Additional Policies

It is expected that students will conduct themselves in a professional manner. Use of connected devices such as cell phones, tablets, etc. during class critique is not allowed, and should only be used during class for the purpose of taking notes or researching information pertinent to the project at hand.

Although the focus of this class is to develop consumer products, it is also expected that much thought and care be put into every component of the project. This includes spelling, punctuation, and grammar, as well as attention to detail such as design layout, cleanliness and craftsmanship, and formatting of homework assignments. Not adhering to these professionalism standards will be reflected in the final grade.

Course Schedule: A Weekly Breakdown

| | Topics/Daily Activities | Homework Assignments | Deliverable/Due Dates |
|-----------------------------------|--|--|---|
| Week 1a (Tues) 8/23 | Target Consumer/Pain Points - Introductions - Lecture - product design process/human centered design. - Project kickoff (framing and parameters) - Discussion on creating informative user questionnaires | - Consider prompts/categories for the semester project. - Create a slide layout design to be used as a consistent format for your project - Conduct in-depth (micro and macro) trend analysis on the subject topic (3-5 slides) - Produce a trend/mood board of the target consumer and include a brief description of the user profile - Create a target consumer insights questionnaire (1 slide, 10-15 questions) | - Trend analysis (min 3 slides) - Target consumer mood board - Insights questionnaire – Due Week 2a (Value – 50pts of total 100pt Market Research grade) |
| Week 1b (Thurs) 8/25 | - Lecture – lessons I’ve learned - Breakout groups (discuss questionnaire) - Individual meetings with professor to discuss project direction | | |
| Week 2a (Tues) 8/30 | Consumer Insights Homework presentations and questionnaire discussion - (market trends, target consumer, and insights questionnaire) - Lecture - the importance of consumer insights. - Discussion/demo on conducting interviews | - Conduct in-person interviews (Minimum of 4 - more is preferred) - Create slides for key insights (1 slide per target user interviewed) – in addition to list of key takeaways from each interview, slides should include name of user, photo (if allowed), age, occupation, and screen shot of zoom meeting or photo of in-person meeting (if allowed) - Produce an on-line survey - Synthesis slide of key takeaways (3 or more) - Create a concise single sentence problem statement | - User insights/pain points (Key takeaways) from interviews - On-line survey results - Key takeaway synthesis (3 or more) - Problem statement – Due Week 3a (Value – 50pts of total 100pt Market Research grade) |

| | | | |
|-----------------------------------|---|---|---|
| Week 2b (Thurs) 9/1 | - Check in with professor - Work in class (interviews) | | |
| Week 3a (Tues) 9/6 | Project Framing - User insights/problem statement presentations - Discussion on problem framing and brainstorm techniques - Break-out groups - mind-map and 'How might we...' | - Create a mind-map showcasing different potential problems and touch points for your product category. - Create minimum of 15-20 'How might we...' framing questions | - Mind-map - 15-20 framing questions – Due Week 3b (Value – 50pts of total 400pt Initial Ideation grade) |
| Week 3b (Thurs) 9/8 | Initial Ideation - Break-out groups - perform 'what if' brainstorming exercise - Demo on vis com/sketching techniques | - Produce 10-15 sketches of initial ideation concepts based on 'what if' exercise | - 20-30 'what if' post-its - 10-15 initial concept sketches – Due Week 4a (Value – 150pts of total 400pt Initial Ideation grade) |
| Week 4a (Tues) 9/13 | Feedback - Group presentations (initial concepts) | - Run initial concepts by target users to obtain initial feedback (document this with photos) - Obtain information on similar products already used by target users | - Obtain user feedback on initial concepts – Due Week 4b (Value – 100pts of total 400pt Initial Ideation grade) |
| Week 4b (Thurs) 9/15 | - Discussion on initial feedback outcomes - In-class ideation/group work | - Revise concepts based on user feedback - Decide on a general project direction | - 10-15 revised concept sketches – Due Week 5a (Value – 100pts of total 400pt Initial Ideation grade) |
| Week 5a (Tues) 9/20 | Competitive Analysis - Homework presentations/group crit (initial concept feedback, general project direction) - Discussion on competitive landscape | - Identify a minimum of 10 competitive products Each should have: - brand and model name of the product - image of the product - retail price point - key features and benefits claimed by manufacturer - pros and cons | - Competitor analysis (min 10 examples) – Due Week 5b (Value – 50pts of total 100pt Competitor Research grade) |
| Week 5b (Thurs) 9/22 | Blue Ocean Strategy - Homework presentations/group crit (competitive analysis – pros/cons) - Discussion on 'blue ocean' vs. 'red ocean' and creating a problem/opportunity statement | - Create a primary and secondary opportunity matrix identifying your product's blue ocean opportunity (NOTE – matrices should include small images of competitor products positioned appropriately on the grid, as well as name and MSRP of each product. You should then have a graphic element depicting the area in | - Opportunity matrices (min of 2) - Problem/Opportunity Statement - Design criteria (min of 7) – Due Week 6a (Value – 50pts of total 100pt Competitor Research grade) |

| | | | |
|------------------------------------|--|--|--|
| | | <p>the top right quadrant where you believe your product should be positioned to show opportunity, as well as intended MSRP)</p> <ul style="list-style-type: none"> - Compose a problem/opportunity statement - Create a list of design criteria (7-10) | |
| Week 6a (Tues) 9/27 | Concept Revision <ul style="list-style-type: none"> - Homework presentations/group crit - (opportunity matrices, problem/opportunity statement and design criteria) | <ul style="list-style-type: none"> - Narrow down to 3 concepts based on opportunity and design criteria - 3-5 high fidelity sketches for each concept (10-15 total) - Sketches should show multiple views and details for each concept and include annotations communicating features and functionality. - Concepts should be ranked in order of preference and presented as such in the midterm presentation. | <ul style="list-style-type: none"> - 10-15 sketches <p>– Due Week 7a (Value – 100pts of total 300pt Design Revision grade)</p> |
| Week 6b (Thurs) 9/29 | <ul style="list-style-type: none"> - Demo on building low-fidelity prototypes - Individual check-in - Work in class/shop | <ul style="list-style-type: none"> - Create low-fidelity prototypes – minimum of one (more is better) | <ul style="list-style-type: none"> - Initial prototypes (1 or more) <p>– Due Week 7a (Value – 100pts of total 300pt Design Revision grade)</p> |
| Week 7a (Tues) 10/4 | <ul style="list-style-type: none"> - Individual check-in - Work in class | <ul style="list-style-type: none"> - Run initial prototypes by target users to obtain feedback (document this with photos) - Consolidate all information into a midterm digital presentation | <ul style="list-style-type: none"> - Obtain user feedback on initial prototypes <p>– Due Week 8a (Midterm)</p> <p>Midterm presentation - Week 8a (Value – 200pts)</p> |
| Week 7b (Thurs) 10/6 | <ul style="list-style-type: none"> - Individual check-in - Work in class | | |
| Week 8a (Tues) 10/11 | Midterm Presentations | | |
| Week 8b (Thurs) 10/13 | Fall Recess | | |
| Week 9a (Tues) 10/18 | <ul style="list-style-type: none"> - Demo on building medium-fidelity and proof of concept prototypes - Individual check-in - Work in class/shop | <ul style="list-style-type: none"> - Create revised medium-fidelity prototypes/proof of concept (POC) model (1 or more) | <ul style="list-style-type: none"> - Medium fidelity prototypes/proof of concept (min of 1) - User feedback <p>– Due Week 10a (Value – 100pts of total 300pt Design Revision grade)</p> |

| | | | |
|-------------------------------------|---|--|---|
| | | - Obtain user feedback on initial prototypes/POC (document with photos) | |
| Week 9b (Thurs) 10/20 | - Individual check-in - Work in class/shop | | |
| Week 10a (Tues) 10/25 | Final Design Direction - Medium fidelity prototype presentations - Individual check-in - Work in class/shop | - Decide on final product direction - Revise concept based on user feedback and produce new high-fidelity sketches/renderings, as well as revised medium fidelity prototypes, considering functionality, human factors, materials, aesthetics, etc. | - Revised sketches/renderings with annotated details depicting functionality, materials, technology, etc. (min of 6 high fidelity sketches and/or renderings) – Due Week 11a (Value – 100pts of total 200pt Final Design grade) |
| Week 10b (Thurs) 10/27 | Prototyping - 3D modelling demo - Individual check-in - Work in class/shop | | - Begin final model – Due Week 14b (Value – 200pts) |
| Week 11a (Tues) 11/1 | - Demo on higher fidelity prototyping techniques - Individual team check-in - Work in class/shop | - Continue to work on final model | |
| Week 11b (Thurs) 11/3 | - Individual check-in - Work in class/shop - Discussion on final presentation requirements | - Continue to work on final model | |
| Week 12a (Tues) 11/8 | Form Language/Aesthetic - Lecture/demo on form and aesthetics - Individual check-in - Work in class/shop | - Produce a 3D CAD rendering - Include computer generated annotations communicating features and details - Produce several form, material, and color studies to determine the final aesthetic. | - CAD renderings (min of 3 renderings of final design in different views) - Form, material, color studies/renderings (min of 5 renderings) – Due Week 14a (Value – 100pts of total 200pt Final Design grade) |
| Week 12b (Thurs) 11/10 | - Individual check-in - Work in class/shop | | |
| Week 13a (Tues) 11/15 | - Individual check-in - Work in class/shop | - Decide on final name of product and create logo | |

| | | | |
|-------------------------------------|---|---|---|
| Week 13b (Thurs) 11/17 | - Individual check-in - Work in class/shop | | |
| Week 14a (Tues) 11/22 | Sell Sheet - Discussion on creating a sell sheet - Individual check-in - Work in class/shop | - Create a one page sell sheet Sell sheet should include: - Product name/logo - One line benefit statement - Picture of product being used in its environment - List of features - Video link (if applicable) - Contact information | - Sell sheet – Due at Final Presentation - (Value – 100pts) |
| Week 14b (Thurs) 11/24 | Thanksgiving Break | | |
| Week 15a (Tues) 11/29 | Final Preparation - Individual check-in - Work in class/shop | - Final presentation should be no more than 10 min, and should quickly and concisely convey the following: - target user - key insights / pain points - opportunity matrices - problem/opportunity statement - design criteria - ideation process (sketches, user feedback, prototyping, user feedback - final product image with annotations calling out features, as well as intended MSRP - image of final product being used in environmental context | Final presentation – Week 15b (Value – 300pts) |
| Week 15b (Thurs) 12/1 | Final Presentation | | |

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of

plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on [Research and Scholarship Misconduct](#).

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call

Studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
eeotix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776
osas.usc.edu

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - (213) 821-4710

campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101

diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, **HSC:** (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, **HSC:** (323) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

ombuds.usc.edu

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - (323) 442-3340 or otfp@med.usc.edu

chan.usc.edu/otfp

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.