PRIN 525: Physical Maker Lab: Techniques, Tools, and Processes for Digital and Traditional Fabrication

Units: 2
Fall 2022 – Tuesday – 12:00-2:50pm

Location: Creator Studio – Iovine & Young Hall, First Floor

Instructor: Jacob Patapoff
Office: Creators Studio/Online
Office Hours: By appointment
Contact Info: patapoff@usc.edu

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
Good designers must understand how to work with physical materials and the fabrication processes to actualize ideas into reality. This class will focus on digital and traditional fabrications techniques through workshops and projects. In this hands-on studio course, students will learn how to work various materials and fabrication techniques including but not limited to wood working, metal working, textiles, plastics, laser cutting and 3D printing.

Learning Objectives and Outcomes
Students will learn about the tools, processes, and techniques for fabricating products within different product category segmentations such as soft goods (i.e. – textiles, etc.) to hard goods (i.e. – wood, metal, plastic etc.).

Prerequisite(s): None
Co-Requisites(s): None
Concurrent Enrollment: None

Software:
Google

Software:
Google slides or equivalent for presentations/deliverables.

Suggested but not required: Illustrator/Photoshop (Adobe Creative Cloud) - $70/annual subscription
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 but not required: Rhino3D - $195
https://www.rhino3d.com/store?audience=Educational
- For 3D modeling/3D printing

Prusa or Cura Slicer (Free)
https://help.prusa3d.com/article/install-prusaslicer_1903
https://ultimaker.com/learn/ultimaker-cura-4-3-available-now
- For 3D printing

Dress Code
Since class will be held in the Creator Studio, please come dressed in shop attire - closed toe footwear, no loose-fitting clothing/jewelry, no dangling strings, ties or scarfs, tie long hair back and up.
http://tiny.cc/usc-shop-rules

Lab Fee
Associated lab fees fund the following –
• Consumable materials used by the students, which range from standard wood, metal and composites to polymers.
Increased studio operating costs, including the labor costs to provide extended weeknight and weekend hours that will be required to accommodate additional student use.

Accelerated maintenance, repair, and replacement costs due to additional student use.

Support students’ continued access to state-of-the-art facilities, allowing them to imagine, create, invent, and innovate across the spectrum of physical and immersive/interactive digital products, services, and systems.

Description and Assessment of Assignments
Class time will consist of in-class demonstrations/workshops and may include the entire class collectively participating in a large group critique or being broken up into having in-class studio time while the instructor conducts individual critique and feedback.

While the weekly workshops/labs projects will make up the majority of each student’s grade, it is also expected that the collective body of work from the semester shall be presented at the end of the semester in the form of digital documentation.

Students are responsible for all assignments, including homework, in-class work, critiques, presentations, demos, readings, process documentation and applicable archiving progress. It is the student’s responsibility to obtain missed work and information if absent. As PRIN 525 is a lab-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 critiques

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 with regard to 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.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>% of Grade</th>
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</thead>
<tbody>
<tr>
<td>Workshop 1 – Safety Training</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 2 – Low Fidelity Prototyping</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 2a – Low Fidelity Object</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 3 – 3D Printing/Scanning</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 3a – 3D Printed Object</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 4 – Laser Cutting</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 4a – Laser Cut Object</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 5 – Textiles</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 5a – Textile Object</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 6 – Wood Joinery</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 6a – Wood Object</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 7 – Metal/Welding</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 7a – Metal Object</td>
<td>50</td>
<td>5%</td>
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<tr>
<td>Workshop 8 – Finishing and Documentation</td>
<td>50</td>
<td>5%</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Documentation</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Participation</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1000</strong></td>
<td><strong>100%</strong></td>
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**Grading Scale**
Course final grades will be determined using the following scale
A    95-100
A-   90-94
B+   87-89
B    83-86
B-   80-82
C+   77-79
C    73-76
C-   70-72
D+   67-69
D    63-66
D-   60-62
F    59 and below

**Assignment Submission and Rubric Policy**
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 ⅓ 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.
# Course Schedule: A Weekly Breakdown

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics/Daily Activities</th>
<th>Homework Assignments</th>
<th>Deliverable/Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Workshop 1: Safety Training&lt;br&gt;- Introductions&lt;br&gt;- Creator Studio safety training</td>
<td>- Identify object/theme&lt;br&gt;- Pull 10 references for what already exists&lt;br&gt;- Break down how you think it was made</td>
<td>- Reference and breakdowns&lt;br&gt;- Due Week 2</td>
</tr>
<tr>
<td>2</td>
<td>Workshop 2: Low Fidelity Prototyping</td>
<td>- Produce 8 sketches of initial ideation concepts</td>
<td>- 8 sketches&lt;br&gt;- Due Week 3</td>
</tr>
<tr>
<td>3</td>
<td>Workshop 3: 3D Printing/Scanning</td>
<td>- 3 concepts for 3D printed object</td>
<td>- 3 concepts&lt;br&gt;- Due Week 4</td>
</tr>
<tr>
<td>4</td>
<td>Workshop 3a: 3D Printed Object</td>
<td>- Submit additional 3D files for printing&lt;br&gt;- 3 reference breakdowns – laser cut</td>
<td>- (2x) 3D prints (different types of 3D printing or different materials covered in class)&lt;br&gt;- 3 breakdowns&lt;br&gt;- Due Week 5</td>
</tr>
<tr>
<td>5</td>
<td>Workshop 4: Laser Cutting</td>
<td>3 concepts for laser cut object</td>
<td>- 3 concepts&lt;br&gt;- Due Week 6</td>
</tr>
<tr>
<td>6</td>
<td>Workshop 4a: Laser Object</td>
<td>- 3 reference breakdowns – textiles</td>
<td>- 3 breakdowns&lt;br&gt;- Due Week 7</td>
</tr>
<tr>
<td>7</td>
<td>Workshop 5: Textiles</td>
<td>- 3 concepts for textile object</td>
<td>- 3 concepts&lt;br&gt;- Due Week 8</td>
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<tr>
<td>8</td>
<td>Workshop 5a: Textile Object</td>
<td>3 reference breakdowns – wood</td>
<td>- 3 breakdowns&lt;br&gt;- Due Week 9</td>
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<tr>
<td>9</td>
<td>Workshop 6: Wood</td>
<td>- 3 concepts for wood object</td>
<td>- 3 concepts&lt;br&gt;- Due Week 10</td>
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<tr>
<td>10</td>
<td>Workshop 6a: Wood Object</td>
<td>- 3 reference breakdowns – metal</td>
<td>- 3 breakdowns&lt;br&gt;- Due Week 11</td>
</tr>
<tr>
<td>11</td>
<td>Workshop 7: Metal/Welding</td>
<td>3 concepts for metal object</td>
<td>- 3 concepts&lt;br&gt;- Due Week 12</td>
</tr>
<tr>
<td>12</td>
<td>Workshop 7a: Metal Object</td>
<td>- Research 10 marketing campaigns</td>
<td>- 10 references&lt;br&gt;- Due Week 13</td>
</tr>
<tr>
<td>13</td>
<td>Workshop 8: Finishing/Documentation</td>
<td>- Produce a slide deck or video documenting your process throughout the semester.</td>
<td>- Slide deck or process video&lt;br&gt;- Due Week 16 (Final Presentation)</td>
</tr>
<tr>
<td>14</td>
<td>Finishing/Documentation and final touch ups. Work on unfinished objects&lt;br&gt;+ documentation.</td>
<td>- Produce a slide deck or video documenting your process throughout the semester.</td>
<td>- Slide deck or process video&lt;br&gt;- Due Week 16 (Final Presentation)</td>
</tr>
<tr>
<td>15</td>
<td>Finishing/Documentation and final touch ups. Wrap up and unfinished objects + documentation.</td>
<td>- Produce a slide deck or video documenting your process throughout the semester.</td>
<td>- Slide deck or process video&lt;br&gt;- Due Week 16 (Final Presentation)</td>
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<tr>
<td>16</td>
<td>Final Presentations</td>
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</tbody>
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Course Hours
This 2-unit course requires 1500 minutes of instructional time per semester, which equals 100 minutes of instructional time each week. In addition, it is expected that students will work, on average, an additional 200 minutes per week outside of class — on readings/viewings, homework assignments, field experiences, and individual or team projects.

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 eeoitix.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 otpf@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.