

Course Information

Number and title: Arch 433 - Intro to Digital Fabrication

Professor info: **Alphonso Peluso**
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Prerequisite(s): DC3 or permission to take the course

Text and Materials: **Project Materials Fee (\$50 - TBD)**
All course resources will be provided on the portal link below:

Resource Location: <http://www.digitalarchfab.com/arch-433-intro-to-digital-fabrication-fall-2023/>

Course description:

This course offers a comprehensive exploration of computer-aided fabrication from concept development and modeling through digital file creation and cutting processes. Using CAD/CAM software, laser cutters, CNC mills, and 3D printers, students with a variety of interests can build the elements of detailed models, fabricate a range of finished objects, or even create landscapes incorporating highly articulated surfaces. The course stresses the integration of the complete thought process from concept development to pre-visualization to detailed modeling to fabrication setup and finishing. Students gain a solid understanding of the rapidly developing world of CAD/CAM techniques while acquiring specific long-term skills in software-based modeling and machine-assisted fabrication.

Course format:

Students will work individually on CNC skill building assignments. For the midterm students will work in groups of (3) on a Furniture project. For the Final students will work as one large group to design and build a small pavilion.

Separate Tasks (examples):

Materials Estimate/Budget, Documentation Video, Documentation Book, etc..

Fabrication strategies:

- Make 'real' things (the course will prepare you for 'real world' projects)
- Learn from precedents (understand them through 'deep' research)
- Learn by making
- Understand the fabrication processes
- Design based on fabrication processes
- Prototype, Prototype, Prototype (you never get it right on the first try)
- Start small then move up in scale
- Document the process and results

Processes / Machines:

- Additive Fabrication / 3D Printer
- Subtractive Fabrication #01 / Laser Cutter
- Subtractive Fabrication #02 / CNC Router
- Mold Making / Vacuum Former

Reading List:(the Internet is the place to start, the publication is the place to end)

- Filson, Rohrbacher, France, *'Make: Design for CNC'*, Maker Media Inc. 2018
- Dunn, *'Digital Fabrication in Architecture'*, Laurence King, 2012 (general dig. fab reference)
- Iwamoto, *'Digital Fabrications'*, Princeton Architectural Press, 2009 (general dig. fab reference)

Grading: Students will be graded on 5 individual assignments and 6 group assignments. Final grade is based on the percentages below:

10% for attendance

(attendance is mandatory, signing in for someone and/or 3 unexcused absences will result in a failing grade)

20% for the individual assignments

30% for the group assignments 1-4

40% for the group assignments 5-6

Please note: attendance, completion and submission of all course work on time is the minimum requirement and does not mean that you will receive an A grade. All grades are subject to the grade judging criteria below:

Grades are determined by judging 4 different categories:

Craft - This course requires a high level of craft and precision. It's required that all fabrications are made to look like works of art.

Legibility - Make sure that your assignment documentation is clear and easy to read. Use spell check (all software apps have it). Your shared folder should be neat and organized with assignment #'s labeled **Firstname_Lastname_A0#**..

Composition - In addition to being legible you should apply all the concepts of composition that you have previously learned. Specifically in this course composition refers to process documentation i.e. writing, photography & fabrication.

Innovation - Expand upon the skill sets taught in the course and apply them to the assignments. Research additional learning resources found on the internet and in libraries. Create your own way to apply the fabrication concepts discussed in the course. Share your innovation in your presentations and project documentation.

Students with Disabilities Statement:

Americans with Disabilities Act (ADA) Policy Statement

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must go through the Center for Disability Resources office. The Center for Disability Resources (CDR) is located at 3424 S. State Street, Suite 1C3-2, Chicago, IL 60616 telephone 312 567.5744 or disabilities@iit.edu.

Class Schedule

Week One: RhinoCam #01 _ CNC #01 _ Engraving _ Profiling
August 25 Form Groups

Week Two: RhinoCam #02 _ CNC #02 _ Engraving _ Profiling
September 01 Pocketing

Week Three: RhinoCam #03 _ CNC #03 _ Drill
September 08

Week Four: RhinoCam #04 _ CNC #04 _ Surface Milling
September 15

Week Five: Form Groups _ Select Midterm Project
September 22 RhinoCam #05 _ CNC #05 _ Flip Milling

Week Six: **Work In Class**
September 29

Week Seven: **Work In Class**
October 06

Week Eight: **Midterm Presentation**
October 13

Week Nine: Design Final Project Pavilions
October 20 Assign group tasks
Process video commencement

Week Ten: (3) 1/8 Full Scale (1'cube) prototype models due
October 27 (can be laser cut)

Week Eleven: Select one of last weeks prototype models
November 03 Build a 1/4 full scale (2' cube) prototype model

Week Twelve: Build a 1/4 full scale (2' cube) prototype model
November 10

Week Thirteen: Build a 1/2 full scale (4' cube) prototype model
November 17

Week Fourteen: **Work In Class on Full Scale Pavilion**
November 24

Week Fifteen: **Work In Class on Full Scale Pavilion**
December 01

Finals Week: **Final Presentation**
December 08

*note: course syllabus & schedule are subject to change