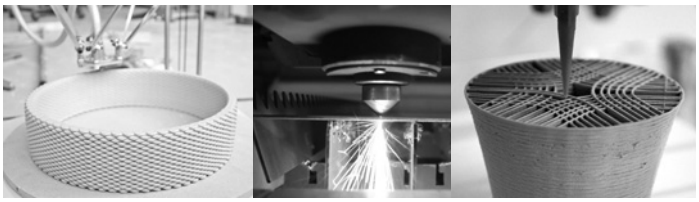
LSU School of Art | Ways & Means | ART 4020 SEC 2



Mo/We 8:30-11:20 AM
Room: 108 Art Building
Instructor: Paul Callahan
pcalla3@lsu.edu
By appointment only

COURSE DESCRIPTION:
This class focuses on workflow integration of digital fabrication tools, such as 3D printers, CNC mills and laser cutters. Students will ask how digital fabrication can be used as both an intermediary process for the production of components, and as a primary process to produce finished objects. Demonstrations will include drawing techniques for Rhino 3D, file preparation and output for three fabrication machines (3D printer, CNC mill and laser cutter) as well as operation instructions for these machines. By the end of this course, a student will have gained practical knowledge of the safe operation of digital fabrication machines, as well as insight on how this technology will benefit them in their studio practice during school, and after, as they seek employment.

Two other goals we have for this semester are, 1. To set up our new Wasp clay extruder on the Delta printer we built last spring. 2. To print objects on the Formlabs printer using burn out resin for metal casting.

This is an object making class. You will be learning some digital visualization techniques (namely Rhino), but the end goal will always be to turn your ideas into tangible objects.

A WORD ABOUT THIS CLASS:
The content I will be presenting to you this semester is largely the result of my research during graduate school and in the four years since. I am a huge proponent of emerging technology; I use it in my work every day and I embed it into the coursework of all of my classes, even the ones whose content isn't as tech-centric as this one. I am, however, equally a proponent of good old analog processes and the craftsmanship that must be developed in order to master them. This is not to say that digital processes do not also require their own brand of craftsmanship. They absolutely do, and I will address this more as we move through the semester. When I think of the work that I have encountered which I find most exciting, it is almost always work that contains a thoughtful and useful integration of digital processes with analog ones. Think of the machines you encounter this semester the same way you think of the other tools in your studio and try to find effective ways to utilize them. The tools we cover will have strengths and weaknesses that are unique to them. As you uncover these strengths and weaknesses, take notes and discuss potential with the class through your project proposal ideas.

I have many goals for us this semester, but my over arching objective is for you to finish this course with an grounded understanding of these emerging digital fabrication technologies and how they might become a step in your process of creating what you create. I have, however, built in a degree of margin when planning this class; space in the schedule and assignments for us to improvise as we progress. Also, I will be treating you all as advanced students. By that, I mean this class will be a little like a choose your own adventure book, but with a few grading checkpoints along the way. I will introduce these tools to you and then give you freedom and support to explore their potential. In terms of grading, I will evaluate you in two major areas, the effort you put into absorbing the information, and how creatively you apply it.

LEARNING OBJECTIVES:
1. Develop a working understanding of Rhino drawing methods
2. Integrate laser cutter, CNC mill and 3D printers into your coursework
3. Install and explore the Wasp extruder nozzle on the Delta printer
4. Print with metal burn-out resin and cast hot metal
5. Discover the application potential of emerging digital fabrication technologies in personal studio practice
6. Think creatively, solve design challenges

METHODS OF INSTRUCTION:
Lectures, discussions, field trips, demonstrations and critiques
METHODS OF ASSESSMENT:
Understanding the Content:
During each assignment you will need to demonstrate an understanding of the content/requirements. This is one way I will be assessing each assignment you submit during this class
Craftsmanship:
Strength of your technical execution and attention to detail in each assignment
Application:
Demonstrated ability to apply selected portions of course content. Not every part of what you learn this semester will be applicable to your work, but some of it will. You should constantly be seeking ways in which to do this
Growth:
As I grade your work, I take into consideration your growth throughout the semester. If you are making a concerted effort to learn the content, it will be evident in the progression of your work

TIMELY COMPLETION OF PROJECTS:
Deadlines are firm. Projects should be completed within the time given and deadlines can only be extended by the instructor on a project-to-project basis. Late projects will receive a 5 point reduction for every class period late. Late homework and quizzes cannot be made up. Students should expect to have 6-12 hours of homework a week.

PARTICIPATION:
Participation and attendance go hand in hand. Participation points are given for each meeting time. If you are not in class, leave early, come late or do not have your supplies your participation grade will be reduced. If you are sick, I will need a doctor's note. Do not schedule other appointments or activities during class time. This is not an acceptable excuse.

GRADING SCALE:
A: 90-100
B: 80-89
C: 70-79
D: 60-69
F: 0-59

PROJECT AND POINTS BREAKDOWN:
-Project 1 (CNC Router): 20%
-Project 2 (3D Printer): 20%
-Project 3 (Laser Cutter): 20%
-Final Project: 20%
-Participation: 10%
-Final Presentation: 10%
100%

EXPLANATION OF LETTER GRADES:
A = Outstanding. Student went above and beyond the description on every project. Student attended every class session, was prepared with supplies and materials. Participated in group critiques/discussions, and shows a curiosity, risk taking, conceptual and technical ability while keeping project deadlines in mind.
B = Above Average. Student adhered to project description while showing some conceptual and technical ability. Good participation in class discussions. Student was present for every class session with supplies and materials.
C = Average. Student completed assignment as stated in project brief. Most work is completed on time and occasionally participates in critiques.
D = Below Average. Student does not complete projects on time. Lacks effort and participation in class critiques. Does not attend class with supplies and materials.
F = Failure. Student shows no effort to complete projects and is frequently without supplies and materials. Student also displays little or no effort to participate in class discussions.

MID-TERM MEETING:
At Midterm, you will meet with me for a 5-10 minute individual review. There are two objectives for this meeting, to update you on your performance in this class, and to discuss your ideas for applying the course content in your personal studio practice. You should come to this meeting prepared with an outline of ideas about how you intend to do this. This meeting is a way for me to gauge how you are absorbing/applying the course content. It is also a good way for you to begin preparing for our final exhibition.

FINAL EXHIBITION
At the end of the semester, we will, as a class, be presenting our work and research. The effort you put into preparing/compiling your work for the final presentation will account for 10% of your final grade for the semester. The dates for the final presentation that are listed in the calendar are tentative.

ATTENDANCE:
There is no substitute for being in class everyday. Please be aware that absences are excused for illness with a doctor's note or a death in the family or other such serious situations only.
-By arriving late to class or leaving early you forfeit half of your participation points for the day.
-By missing a class you forfeit all of your participation points for that day.
-Failure to bring tools and materials, or other supplies necessary to work in class will result in the student being counted as absent.
-Absences directly affect your participation grade. 3 or more absences will result in a report to the Dean's office where they will take further action.
*If you are late or absent, it is your responsibility to contact a classmate in order to learn what you missed. Only after you have done this should you contact me about missed content.

CELL PHONE POLICY:
I don't want to hear your cell phone or see you texting. You are all adults. If you need to answer a phone call, you must leave the room. If I hear your phone, or see you texting in class, you will loose your participation points for the day.

SUPPLIES:
You will be providing supplies for your projects this semester, so be on the lookout for anything usable that is cheap or free. Just so you are aware, here is a list of items you will have to pay for:
-Laser cutting (time using the Design Shop machines)
-Laser cutter materials
-3D printing (depending on the printer you use)
-Rhino 3D program license

These are items provided for you:
-High density foam for CNC milling
-Burn-out resin for Form 2 printer
-Clay to print with and firings

CADGIS:
The hours for CADGIS will be posted on the entrance door. It is your responsibility to know what these hours are in order to complete your work for this class. We have this lab reserved for the first hour of our meeting times. Other classes may have this room reserved throughout the semester, however, most instructors allow other students that are not in their class to use the lab as seating availability permits. But, please be aware that they have the right to ask you to move or leave to give their students priority. Respect this and also realize that it will not be accepted as a valid excuse for not completing work.

RHINO ON YOUR COMPUTER:
PC student version - $195
Mac student version - $195
Non-student PC version - $995
Non-student Mac version - $695
There is a free trial version, but the license only lasts 90 days. See, www.rhino3d.com

PROJECTS
You will have two options for projects 1,2 & 3, you can adhere to the project brief which I supply you, or you can submit a formal project proposal. If you choose to submit a proposal, you must lay out a calendar for the entire assignment with specific deadlines for each step, and you must adhere to these requirements:
Project 1 must utilize the CNC Mill.
Project 2 must utilize the Form 2 printer with burn-out resin, or the Wasp clay extruder.
Project 3 must utilize the laser cutter.

RESEARCH:
We have two unique research opportunities this semester. One is to install the new Wasp clay extruder for the Delta 3D printer and test it out. This will involve some independent research on your part as well as a lot of testing to discover the possibilities of this new tool. We will be printing pieces and firing them in kilns that are housed in the LSU ceramics department. The second opportunity is to print objects on the Formlabs printer using the burn-out resin. This will allow us to use the foundry to pour molten metal into the molds to cast our parts in either aluminum or bronze.

COMMUNICATION:
The best way to contact me is by email. I check it often. I do not have an office, but I am easy to find. Usually, I am either in Room 133 in the Studio Arts Building, my studio in the Studio Arts Building or in the Design Shop which is room 110 in the Art Building. If at any point during the semester you are struggling in any way, please communicate that to me. I cannot be accommodating or helpful if you do not express your concerns to me.

DOWNLOADING/PRINTING THE RHINO MANUAL:
You are all required to download the Rhino training manual. It can be found at www.rhino3d.com in PDF format. It is called “Rhino 5 Level 1 Training Guide”. There are also a list of Rhino files that accompany this text, and these can be downloaded from the same website.

OTHER CLASS POLICIES:
1. All cell phones must be silenced during class.
2. All students are expected to complete their own projects independently (with the exception of group projects). Any work completed non-independently will be considered cheating and result in appropriate disciplinary action, a failing course grade will be filed.
3. Any student with a disability needing accommodations should make themselves known to me. Office of Disability Services: 1-225-578-5919
4. Discriminatory, unsafe, or disruptive behavior will not be tolerated in class at any time.