

Syllabus

ART 4642C, Spring 2020

Digital Fabrication

Location: FAC 0306

Time: Tuesday/Thursday 3:00 PM - 6:00 PM

Instructor: Daniel Jolliffe

Email: danieljolliffe@ufl.edu

Office Hours: Tuesday/Thursday 2PM–3PM. Please email me prior to let me know you are coming. Other times possible by appointment. If you have course questions, feel free to email me anytime.

Course Description

This course explores the possibilities and technologies of digital fabrication in the context of contemporary art practice. Students will gain a basic proficiency with computer-aided design (CAD) software, using it to design several creative projects. The use of the department's [Fab Lab](#) resources (laser cutting, CNC routing, waterjet cutting and 3D printing) for the realization of creative projects is central to the course.

In parallel with the creative projects we will look at how artists have used digital fabrication processes in areas as diverse as sculpture, public art, design and kinetic art.

This is a highly technical course. Students should expect to spend significant amounts of time out of class acquiring the CAD/CAM skills necessary to complete projects. The course will be intensively lecture-based at the outset, moving towards a studio model of production as the class gains basic competencies in digital fabrication.

Student projects include an artist presentation, two technically-oriented machine exercises and three significant creative projects.

Learning Outcomes

Upon completing the class students should:

1. have developed basic skills in using modelling software (CAD) to create designs for computer-aided manufacturing (CAM);
2. be able to navigate the process between conceptual design and physical product in the digital fabrication process;
3. have a critical awareness of the possibilities of digital fabrication;
4. be able to design basic to mid-level projects destined for digital fabrication outputs;
5. be aware of how artists have historically used machines and digital fabrication to create artworks.

Course Policies

This class will combine individual work in the lab with individual and group instruction. It will be necessary to work outside of class to complete all projects and assignments. A minimum of six hours per week of work outside of class is suggested to get an average grade of a B.

Participation in all class discussions and critiques is considered in the final grade for each project. At any time in the creation process students should be able to produce notes, drawings, charts etc from their sketchbooks, as well as discuss and articulate the nature of their work to their peers as well as to the instructor.

Materials and Fees

This is not an inexpensive course in terms of materials and fees.

1. **Laser membership:** you are required to buy a laser membership for the FabLab. This costs \$150. (Note: Using workarounds like sharing a laser membership can result in you being barred from the lab. If you are barred from the lab you will not be able to pass the course, as you will not be able to use the machines.)
2. **Materials:** you will need to purchase materials for this course. For example, the laser-cutting projects will require a range of materials from paper to cardboard and acrylic. CNC projects will require the purchase of wood or metals. 3D printing project will incur plastic materials fees. Estimate \$50 to \$150 for this.
3. **Lab fees:** Both CNC and 3D printing projects will also incur user fees charged by the FabLab. Estimate \$60 to \$150 for this.
4. A three-button mouse with scroll wheel. This is an absolute necessity; you will see why. Any cheap one will work, you need not spend more than \$10 or \$15. [Example](#).
5. **Calipers:** you will also need a pair of digital vernier calipers or plain dial vernier calipers. These cost about \$20 or less for the basic version. The calipers are your way to measure things in the real world, so that you can compare the real world values to the software and machine-

world values. **Make sure they have a metal frame and not a plastic one, and can switch between inches and mm.** Some ideas for where to get them:

- [Ebay has the standard item](#) for \$10 with shipping.
 - [Sparkfun has the same thing](#) for \$14.95 plus shipping.
 - [Amazon also has them](#) for \$15.
 - [Harbor Freight](#) has the same thing for \$18.
 - [Home Depot has it](#) for \$22.
 - If you appreciate precision, Starrett or Mitutuyo are the premium brands. These are what machinists use, and they will last forever. These will be at least \$100 each and up to \$500 or more; if you see them cheaper than \$100 they are likely copies, or used.
6. A sketchbook. You should have this at each class and be able to produce it on request.

Distribution of grades

- Artist presentation: 15% of final grade
- Three projects: 60% of final grade
- Machine exercises: 10% of final grade
- Participation: 15%

Project Evaluation Criteria

Adherence to assignment guidelines is the baseline criteria. Meeting the assignment guidelines and requirements will lead to a C+ grade. Meeting the following criteria will lead to higher grades:

- *Quality of execution*: is the work carefully crafted?
- *Effort*: did you make a substantial and sincere effort?
- In the case of the three major projects, *artistic originality of work*: essentially, did you make something new and original? It does not have to be a masterpiece, but it does have to be a unique work that reflects your process.
- *Verbal presentation of work during critiques*, if applicable: did you clearly and effectively articulate your work and concept?
- *Documentation*. For each project you will be asked to provide a PDF "one sheet". Was this carefully photographed and written?

Participation evaluation

Participation will be graded holistically based on:

- your contribution to class discussions and critiques, and
- your overall effort and approach to assignments and class work.

Artist Presentation Evaluation

The artist presentation will be graded based on:

- depth of insight into artist's work
- quality of the visual and oral presentation

Grading Scale

Assignments will be graded in Canvas and given a numerical value as follows.

- A 94-100: superior work that meets the assignment guidelines and surpasses all evaluation criteria in an exceptional manner
- A- 90–93.99: superior work that meets assignment guidelines and surpasses all evaluation criteria
- B+ 87–89.99: very good work that meets assignment guidelines and surpasses most evaluation criteria
- B 83–86.99: above average work that meets assignment guidelines and surpasses a few evaluation criteria
- B- 80–82.99: slightly above average work that meets assignment guidelines and has evidence of meeting one of the evaluation criteria
- C+ 77–79.99: adequate, average work that meets assignment guidelines but not additional criteria
- C 73–76.99, adequate but below average work that does not completely meet assignment guidelines
- C- 70–72.99, less than adequate work that meets some assignment guidelines
- D+ 67–69.99: barely meets assignment guidelines
- D 63–66.99 fails to meet assignment guidelines
- D- 60–62.99 fails to meet assignment guidelines
- E 0–59.99: entirely fails to meet assignment guidelines

Your final grade for the course will be the letter equivalent of your calculated numerical grade for all projects and participation.

A grade of C- or below will not count toward major requirements. For more information on UF policies on grade points, see <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

Attendance

Regular attendance is a basic expectation of university education. You are expected to attend all classes. While it is not recommended, you may miss up to two classes without penalty. The third, fourth and fifth absences will cause a one letter grade drop for each absence in your final grade. Upon the sixth absence, a failing grade for the entire class will be assigned. See also the university regulations for attendance: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx#absences>

Instruction will not be repeated for classes that you miss. If you miss a class, check with a classmate and on the syllabus page to see what material you missed. You do not need to email me to let me know you are missing a class, unless it is an exceptional circumstance and you expect to miss many classes (e.g. extended illness, death in the family etc.).

Lateness

Do not be late for class. Repeated lateness will reduce your participation grade.

Late submission of work

All assignments are expected to be submitted on time. In the case of an exceptional circumstances (illness, death in the family etc.) please contact see me regarding for an extension of the due date. In other cases, accepting late assignments is at my discretion and this will incur a grade drop, also at my discretion.

Accommodations for students with disabilities

I am happy to provide accommodations for students with documented disabilities. You must first register with the Disability Resource Center (see <https://disability.ufl.edu/>). The DRC will provide documentation to you, and you bring this documentation to me so that we can work out the appropriate accommodation.

Required textbooks

There are no required texts. Readings will be provided in digital form.

Data Storage

You are required to make digital backups and iterations of your project to avoid losing work. If your project is lost and you do not have a backup, you will still be held responsible for delivering the project in on time. There will be no exceptions. Computer failure, equipment malfunction, and file corruption are not accepted as excuses for late or unfinished work so **back up your work.**

This is extremely important. Establish a data storage method early in the class. The smartest thing to do is to use cloud storage (icloud, Dropbox etc.) that you periodically back up locally. Keep everything in the cloud *and* back it up locally.

Saving

Periodically changing the version number or date in the file name of your program (e.g. "ModelOfALargeAvocado.3dm") is a very wise idea, as you will be saving old versions that you can go back to if needed. You will also be saving a copy of your programming process, and all the things you have tried along the way. After a few days your file list should look something like this:

ModelOfALargeAvocadoJan17-2019.3dm
ModelOfALargeAvocadoJan18-2019.3dm
ModelOfALargeAvocadoJan19-2019.3dm
ModelOfALargeAvocadoJan20-2019.3dm

Software

All of the software we will use will be provided on lab computers. If you wish to work at home rather than in the labs, it is your responsibility to acquire and install the software. Whatever the case, the university only supports the software in the labs and not any software on your own computer. **If you want to acquire Rhino Cad for your own computer, be aware that we will be using Version 5,** which is not the most current version.

Originality

Unless otherwise stated, all digital files and digitally fabricated objects included in your submitted work must have been produced by you, during the course of this class. Creative-commons or similarly licensed 3D models in the Public Domain are the work of others; do not use them your work unless you have received specific permission to do so.

Using stock 3D models (i.e. something designed by someone else) is not generally allowed, but may be permitted in some rare cases. If you want to use a model designed by someone else, in all cases you need a) my permission and b) to clearly indicate the portions of submitted work that are not your own. In short, do not download material made by others to include in your work unless the inclusion has been approved. See also the academic honesty section below.

Academic Honesty

You are required to abide by the Student Honor Code. Any violation of the academic integrity expected of you (e.g. cheating, plagiarism) will result in a minimum academic sanction of a failing grade on the assignment, and may include a reduced participation grade and redoing the assignment for no credit. Second offences will result in an automatic failing grade for the class. Any alleged violations of the Student Honor Code will result in a referral to Student Conduct and Conflict Resolution. Please review the Student Honor Code and Student Conduct Code at sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/

For clarity, plagiarism is the direct copying or paraphrasing of someone else's work without attribution. A minimal amount of material written by others may be included in your written assignments with proper attribution, but bear in mind that professors are looking for originality in thought and writing rather than a demonstration of your ability to cut and paste. Including material written by others or paraphrased from someone else's work is generally used to illustrate a point you want to make, and the other person's work will generally will not earn you any credit: it is there to support your ideas, which is what earns you credit.

Email and communications

All email correspondence will be through your UFL gatorlink email address. You are responsible to check your email on a daily basis. No excuses for not having read email will be accepted. It is recommended that you do not forward your UFL email to other services. Other services will sometimes mark UFL email as junk/spam, resulting in you not receiving it. This is not a valid excuse. I commit to responding to your email within 24 hours during the week, and within 48 hours on the weekend.

Cellphones

Cell phones do not, in general contribute positively to the learning environment. They must be silenced during class. Repeated use of a cell phone in class will lead to a reduction in the participation grade.

Evaluations

Students are requested to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester.

Disruptive Behavior

Be advised that you can and will be dismissed from class for disruptive behavior. More detailed information on this can be found in the UF rules and policies.

Computer Use and Acceptable Use policy

All faculty staff, and students of the University of Florida are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. See <https://it.ufl.edu/policies/acceptable-use/acceptable-use-policy/>

Wellness

Contact information for the Counseling and Wellness Center: <https://counseling.ufl.edu/>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Health and safety

See the handbook at <https://arts.ufl.edu/academics/art-and-art-history/health-safety/>

You must complete a H&S STUDENT WAIVER FORM (available next to the copier in the SAAH office) and on-line (see address above). Waivers must be turned into the SAAH Director of Operations before the end of the 2nd week of classes. Please staple the course sheets together.

Digital media safety guidelines

1. Hazards of Materials: Batteries, old monitors, lamps from digital projectors if broken may release mercury. There are no known health hazards from exposure to intact lamps.
2. The department's digital media technician is certified by the University of Florida to handle hazardous waste.
3. For installations, sets or sculptural elements, please cross- reference with other area specific information as needed
4. Area Rules
 - Follow all SA+AH Health and Safety handbook guidelines.
 - Alcohol is not permitted, even in closed containers.
 - No smoking in the building or within 50 feet of the entry.
 - Do not eat or drink in the lab.
 - Wear shoes at all times.
 - Protective equipment must be worn for hazardous work.
 - Do not block aisles, halls or doors with stored items or when working. This is a violation of fire codes.
 - Do not store anything on the floor. This impedes cleaning and creates a hazard.
 - Do not park bikes in the building.
 - Clean up spills immediately.
 - Take items which do not fit into the trash to the dumpster, following dumpster guidelines.

SA+AH container policy

There are 2 types of labels used in the SA+AH: yellow and white. Both labels are found at the red MSDS box and are supplied by the SA+AH. Each is used for a different purpose.

- White: All new and or used product in containers (hazardous or what might be perceived as hazardous -i.e. watered down gesso, graphite solutions, satellite containers of solvents, powders, spray paints, fixatives, oils, solvents, etc.) must be labeled within the SA+AH area to identify their contents. Labels can be found at the MSDS box in each studio and work area.
- Yellow: designates container as waste. All waste containers must have a yellow label identifying the contents that are designated as trash for weekly EHS pick up. Waste enclosed in Flammable solid containers (red flip top), 5-gallon jugs and fibrous containers must have a yellow hazardous waste label on the outside (top). Each item in the blue bin must have a yellow hazardous waste label. All containers must be marked with your name, contents and date opened. All secondary/satellite containers for hazardous materials must be marked with content, your name and the date opened.
- Unmarked containers will be disposed of without notice.