## Expanded Design - GD 5035

**Time:** Thursday 4:00 pm - 7:00 pm

**Location:** Digital Fabrication Lab

**Class Blog:** aagricola.net/18/ED

I will post everything that we are covering in class at the beginning of our class time. At the bottom of each day's posting will be your homework assignments due for the following class (unless otherwise stated). This will be an archive for you to return to as needed.

## INSTRUCTOR

**Instructor:** Amanda Agricola

**Office:** Dfab lab unless otherwise specified

**Office Hours:** Thurs. 7-9 pm

**E-mail:** aagricola@mica.edu

*If for some reason I do not respond in 2-3 days, e-mail again because there is a chance that your e-mail slipped past me unnoticed.

**Fab Lab Hours:** visit the fab lab website for most up to date schedule of open hours. http://staff.mica.edu/rmckibbin/

## BULLETIN DESCRIPTION

This hands-on course introduces students to a variety of topics related to expanded design, prototyping and interactivity through tutorials, collaborative experimentation and guided studio time. The course will survey design-centric techniques to utilize 3d software, coding with Processing, physical computing with Arduino and time-based media for web. Students will learn how to prepare files for digital fabrication and prototyping. The course will enhance students' understanding of design processes as tools for experimentation, collaboration and reaching new audiences. Students will come out of this class with projects and skills that help to bridge the digital screen based world with physical design objects. Guest lectures and readings will provide a cultural and technical framework projects. This course is open to novices and to those seeking to expand their practice.

## UNIQUE ASPECTS INCLUDE:

- "flipped classroom" - tutorials as homework, hands on work in class
- balancing demand on resources
- complexity in software, hardware, and materials
- Short class with optional extended studio time until 9pm
- Self directed research with Creative Process Journal for final project

## LEARNING OUTCOMES

- Students will gain proficiency with the 3D modeling program Rhino.
- Students will learn to safely and effectively operate the laser cutters and how to determine proper settings for the given material and operation.
- Student will gain an understanding of multiple 3D printing technologies and operate filament-based 3D printers.
- Cultivate a working understanding of various processes and best practices for coding, physical computing and rapid prototyping.
- Students will learn to safely and effectively operate the CNC router and how to generate toolpaths from their CAD file using RhinoCAM
- Student will gain an understanding of algorithmic processes and the spreading effects of computation into physical objects and lived space.
- Apply expanded design thinking when ideating through project parameters to create connections between processes and concepts as they relate to a personal art/design practice and goals
- Create and use digital files that conform to best practices in regards to format, compression, output and archiving.

## Materials All Semester

- Appropriate Attire (see below)
- Storage device or cloud-based file backup
- (Dropbox, Google Drive, Github, BitBucket, etc.)
- Prototyping supplies (sketchbook & writing utensils, optional: cardboard, plexiglass, wood)

## Second Section

- Arduino UNO kit ($25-$75 online)
- Small breadboard (>= 400 points)
- Small box or storage container with dividers (like a tackle, tool box, or caboodle)
- Choice materials for fabricating project (could vary largely by student $30-$200)

## Attire

Come to class every week dressed to work in a fabrication studio. If you are not properly dressed for class, you will be sent home to change and counted late.

- Footwear - Open-toed shoes are never permitted. Do not wear shoes with slick soles or high heels. A solid pair of work boots/shoes are recommended.
- Pants - No shorts, skirts, or dresses.
- Shirt - Be sure that your shirt, and all of your clothes, fit well. Loose clothing can get caught in machinery and pull your hands and body into it.
- Gloves - You should have a pair of work gloves to protect your hands while handling certain materials. Be sure to wear your gloves when you should, and don't wear them when you shouldn't. Gloves are unsafe when operating machinery that could grab the glove and pull your hand into the machine.
- Hair - If you have long hair, you must tie it back while working in the shop.
- Jewelry - No large or dangling jewelry should be worn in the studio.

| | |
|---|---|
| Aug 30 | Introductions, Syllabus Review, Tour of Fab Lab, Intro to Rhino Hw: Read, watch Lynda, 2D assignment |
| Sep 6 | Review Rhino files, laser cutter intro HW: Finish cutting stencil, watch Lynda Ch 7-10, find something to re-design |
| 13 | Look at Stencils, Measuring with calipers, demo 2D to 3D, Designing for 3D printing HW: Read, Re-design assignment |
| 20 | 3D Printing demo, work time for modeling and printing HW: finish modeling and print |
| 27 | NO CLASS HW: Finish Re-design and submit documentation, read Rhino CAM manual |
| Oct 4 | Project 1 work, CNC<br>~~Mini crit of re-design assignment, Rhino layouts for milling, demo CNC, Introduce Project 1~~ HW: Review Rhino CAM |
| | Sun, Oct. 7: Workshop in Station, Intro to Arduino |
| 11 | Project 1 work CNC experience cutting joint, begin working on Project 1 HW: Work on Project 1 |
| 18 | Critique ~~Work on Project 1 HW: Finish Project 1~~ |
| 25 | Arduino, Sensors, Soldering ~~Project 1 Critique HW: Parametric Design Readings~~ |
| Nov 1 | Discussion, Grasshopper Basics HW: Begin Research journal for final project, Grasshopper assignment |
| 8 | Grasshopper data ~~Analog sensors, intro to Arduino, Soldering HW: Watch Arduino tutorials, research for final project~~ |
| 15 | |
| 22 | NO CLASS // THANKSGIVING BREAK HW: continue research for final project |
| 29 | Project work day |
| Dec 6 | Project work day, Course Evaluations |
| 13 | Project Presentations / Final Critique (U102) |

## GRADES

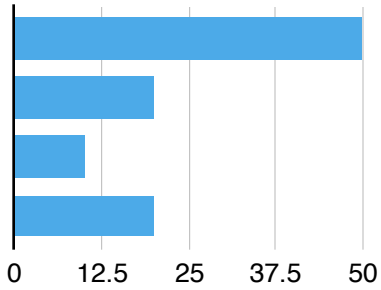
This class is pass/fail. You must earn above a B in order to pass.

**Assignments:** 45%

**Projects:** 25%

**Documentation:** 20%

**Participation:** 10%




## PROJECT EVALUATION

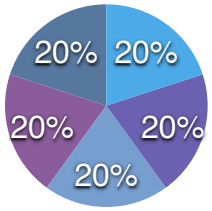
20% **Fulfills the assignment**

20% **Thoughtful presentation**

20% **Demonstrates technical ability**

20% **Conceptual thoughtfulness**

20% **Process and problem solving**




## DEADLINES

**All projects and homework are to be completed by the start of class on the assigned due date. You will put your project in the appropriate file format in your google drive folder.Unfinished work will not be discussed in class, however, once completed, documentation of late work can be submitted directly to me with a PENALTY OF A LETTER GRADE PER WEEK.**

## ATTENDANCE POLICY

| 0-1 | 2-3 | 4... |
|---|---|---|
| GREAT | 10% grade drop | UGH, FAIL |

15 minutes late = 1/2 Absence

Leaving over 15 minutes early = 1/2 Absence

**If you miss a class you are still responsible for all of the material covered as well as any assigned homework**. BE SURE TO CHECK OUR BLOG FOR WHAT YOU MISSED!!!

## GOOGLE DRIVE FOLDER

Documentation (at least 2 images) of each homework assignment should be submitted to canvas. For Projects submit 5 thoughtful and edited images or 1-2 minute edited video. As you will notice, this is part of your grade.

## PROJECT 1

Use at least two of the three machines learned in the first part of class. Design something that enhances the display of an artwork that you have previously made. (Think IKEA shelf re-design.) How can you make something that holds or accompanies your work but also serves to tie in the concept or formal aspects? You are striving for an overall cohesion with the object and the way that it is exhibited. For an added challenge, two parts must nest or fit together perfectly.

## FINAL PROJECT

The final project is intended to give you the opportunity to further explore some of the concepts and materials we learn in a more personally exciting and interesting way. This is your opportunity to demonstrate your handling of the skills learned, to learn new skills as needed, and to ask questions and get help along to way.  Part of this project is research based, so you will formulate a research question and I ask that you keep a journal of the research you do toward to final outcome. This will help you to make your final presentation that should be five minutes and explain your question, process, and outcome.

## PARTICIPATION

As a citizen of the classroom, you are expected to actively participate in class exercises, discussions, and critiques. In addition, this class is intended to function as a peer learning environment. I encourage you to support and talk to one another during class, particularly if you are experiencing any difficulty.

## COLLABORATION

Collaboration on projects is welcomed and encouraged! However, each team member must carry their own weight in the development and documentation of a project. Afterwards, each collaborator will fill out a brief Peer Review form, which will

allow you to discretely provide feedback on your collaborators. Grades will be given individually, and this feedback will be taken into account when factoring grades.

## HELP!

We'll be covering a lot of material this semester which may be completely new to you. Please keep in mind that acquiring any new skill can be a slow and difficult process. Whenever you think you need help outside of class, please let me know as soon as possible and we can schedule a time to meet, or if you provide me with enough details I can sometimes assist through e-mail...

Include:

- All necessary files
- Detailed explanation of what you are trying to do
- Don't forget to consult your peers and the Internet when you run into problems as well!
- Please start your homework ahead of time so that any questions can be directed to me at least 48 hours before class.
- As much as I'd like to assist you, requests on the night before may go unanswered. This will not be an acceptable excuse for missing a deadline.

## HEALTH AND SAFETY IN THIS CLASS

Safety will be an ever-present issue, which will develop as we learn new techniques and materials throughout the semester. Like other topics in this class, your grade will be affected by demonstrating your comprehension and application of safety rules. More importantly, your physical health and safety, and that of your class and studio mates, is at stake. It is absolutely imperative that you follow rules given by the instructor, posted in the studio, and stated by the shop manager, tech, or work study. Failure to follow safety rules could result in destruction of very expensive equipment, fires, blindness, loss of body parts, or other injuries. Following the basic safety rules described in

class and reinforced in the studios ensures everyone's safety. Failure to do so will not be tolerated. Egregious or repeated failure to follow safety rules will result in your removal from and failure of this class.
While less dramatic, working on computers for extended periods of time poses its own health risks. Be sure to adjust your seat properly, maintain good posture, and take breaks to give your eyes and body a break.

## A WORD FROM OUR SPONSORS:

**Americans with Disabilities Act**

Any student who may need an accommodation based on the potential impact of a disability should contact the Learning Resource Center at 410-225- 2416, in Bunting 458, to establish eligibility and coordinate reasonable accommodations.

**Environmental Health and Safety (EHS):** Students are responsible to follow health and safety guidelines relevant to their individual activities, processes, and to review MICA's Emergency Action Plan and attend EHS training. Students are required to purchase personal protection equipment appropriate for their major or class. Those students who do not have the proper personal protection equipment will not be permitted to attend class until safe measures and personal protection are in place.

**Plagiarism**

Each discipline within the arts has specific and appropriate means for students to cite or acknowledge sources and the ideas and material of others used in their own work. Students have the responsibility to become familiar with such processes and to carefully follow their use in developing original work.

**Policy**

MICA will not tolerate plagiarism, which is defined as claiming authorship of, or using someone else's ideas or work without proper acknowledgement. Without proper attribution, a student may NOT replicate another's work, paraphrase another's ideas, or appropriate images in a manner that violates the specific rules against plagiarism in the student's department. In addition, students may not submit the same work for credit in more than one course without the explicit approval of all of the instructors of the courses involved.

**Consequences**

When an instructor has evidence that a student has plagiarized work submitted for course credit, the instructor will confront the student and impose penalties that may include failing the course. In the case of a serious violation or repeated infractions from the same student, the instructor will report the infractions to the department chair or program director. Depending on the circumstances of the case, the department chair or program director may then report the student to the appropriate dean or provost, who may choose to impose further penalties, including expulsion.

**Appeal Process**

Students who are penalized by an instructor or department for committing plagiarism have the right to appeal the charge and penalties that ensue. Within three weeks of institutional action, the student must submit a letter of appeal to the department chairperson or program director, or relevant dean or provost related to the course for which actions were taken. The academic officer will assign three members of the relevant department/division to serve on a review panel. The panel will meet with the student and the instructor of record and will review all relevant and available materials. The panel will determine whether or not to confirm the charge and penalties. The findings of the panel are final. The panel will notify the instructor, the

chairperson, division, the student, and the Office of Academic Affairs of their findings and any recommendations for change in penalties.

**Title IX Notification**

Maryland Institute College of Art seeks to provide an educational environment based on mutual respect that is free from discrimination and harassment. If you have encountered sexual harassment/misconduct/assault, please know that there are multiple ways to report it and you are encouraged to do so (www.mica.edu/equal_opportunity). Additionally, in order to meet our commitments to equity and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, faculty and staff members are required to report disclosures of sexual violence made to them by students, except when prior notice regarding a specific classroom assignment or discussion is provided. If you require academic accommodations due to an incident involving sexual harassment or discrimination, please contact Student Affairs at 410.225.2422 or Human Resources at 410.225.2363.

**Students with Extended Illness or Cause for Legitimate Absence**

In the case of extended illness or other absences that may keep the student from attending a class for more than three meetings, undergraduate students must contact the Student Development Specialist in the Division of Student Affairs. The Student Development Specialist will then work with the student to determine the cause and appropriateness of the absences and subsequently notify instructors as necessary. Graduate students must contact the instructor, program director, and the

Office of Graduate Studies. Students in art education or professional studies programs must contact the Dean for the Center for Art Education or the Associate Dean for Open Studies, respectively. The appropriate administrator will facilitate a conversation with relevant faculty to determine whether the student can achieve satisfactory academic progress, which is ultimately at the sole discretion of the faculty member.