SENSORS & ELECTRONIC ART
ART 4645C Section: 2118
Fall 2018 Syllabus
Professor: Ernie Williams-Roby

Room FAC 306
Mondays & Wednesdays
8:30 - 11:30

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Office Hours: Wednesdays12:00 – 2:00 p.m.
Office: FAC 302C

Overview

Sensors for Artists is a course designed to launch creative projects utilizing physical computing concepts and materials. Throughout the semester students will learn the basic principles of electricity in order to design circuitboards and programs for expressive and experimental purposes.

This course will cover the Arduino microcontroller and many peripherals including but not limited to small motors, LED light effects,controller input, sound, serial communication, WiFi, and more. Students will also learn how to read circuitry schematics and design circuits of their own as well as build them in the soldering lab. This course will also require, at the minimum, basic programming using the Arduino software.

In addition to the technical aspects of learning physical computing in this course we will also collectively deeply question the roles of technology and interactivity through readings, discussions, and writing.

Projects will require students to create strong conceptual presentations centered around specific component. A semester-long project will be undertaken by each student based on their own experiments and inquiries in physical computing.
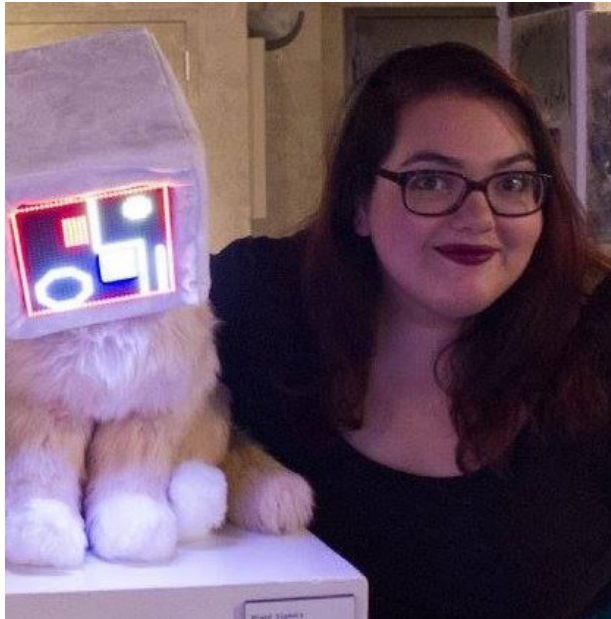
2016 Sensors student Jen Herrara with her oft-sculpture project with embedded electronics


The Arduino Uno board for experiments and learning physical computing.

Course Objectives

- Explore recent and current trends in digital arts and experimental media research

- Learn techniques of basic electronics

- Create art work that that explores interactions between humans and processes such as motion, mapping, sound, position, gesture recognition

- Learn to solder and wire

- Demonstrate skills in basic programming with Arduino and Processing to facilitate the interface between humans, objects, and sensors

- Integrate tools and concepts from science & technology into art making

- Articulate theoretical perspectives relevant to cultural experimentation with embodiment, physical computing, motion detection, gesture recognition, activated objects and alternative interfaces

- Attend the Orlando Maker's Faire and visit Skycraft

- Documentation of work and creating with purpose outside of the classroom

Materials Provided

- Arduino kit including all materials needed for the book with carrying case
- Computer and software lab
- Soldering stations and supplies
- Some Semester Project Materials
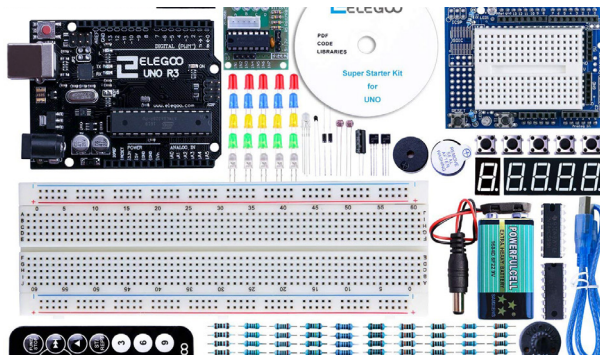
Materials Purchased

- Semester Project Materials notccovered
- The book Exploring Arduino by Jeremy Blum (2nd Edition)

https://www.exploringarduino.com

Suggested Materials

- USB Flash Drive or other storage device
- Sketchbook

Software

- Arduino
- Processing
- Adobe Suite for documentation

Reading List

Exploring Arduino (2nd Ed.) by Jeremy Blum
A Rant About Technology by Ursula K. Leguin
A Cyborg Manifesto by Donna Haraway
Getting Started in Electronics. Forrest M. Mims III
Manga Guide To Electricity by Kazuhiro Fujitaki and Matsuda
There Will Come Soft Rains by Ray Bradbury

Course Structure

Weeks 1-5: intro to electronics, microcontrollers, digital input and output
Weeks 6-10: analog input & output, motors, controllers
Weeks 11-16: Semester Project development and critiques
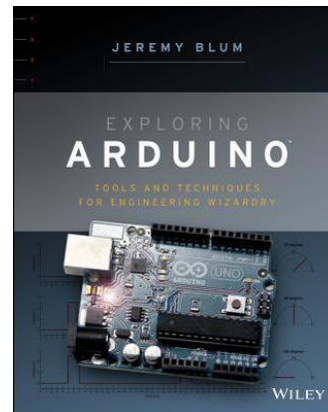
*The Marston Science Library also houses an Arduino library and resources for students wishing to explore additional peripherals and hone their physical computing skills.

Many of these items are supplied as part of your lab fees in the form of a "kit". This class has two types of kits.

There are also components that you are welcome to use are located in the Electronics Studio next to Jack Stenner's office. Depending on what you make, you may need to purchase a few extra components for your projects or if you let me know soon enough, I can look into purchasing if there are available funds.

Giving Credit--Many of the ideas and resources for this class came from Rob Faludi and Tom Igoe's Physical Computing Class at NYU's ITP program http://itp.nyu.edu/physcomp/ and Fernando Orella's cached version of Physical Computing class at Union College.

A massive thank-you and acknowledgment to Katerie Gladdys for developing this course, organizing the supplies, and pooling a tremendous amount of resources so that students can have a fulfilling experience with physical computing.

Grading & Evaluation

Grades are meant to reflect effort, ideas, and execution. Your overall grade will be based on your projects (including creativity, critical thinking, engagement with course information, research, presentation, technical proficiency with hardware and software, aesthetic application of technologies, and problem solving) and participation. Expectations will be explained in detail for each project when it is assigned. If anything seems unclear, you are responsible for asking the instructor for clarification far in advance of the due date. The most successful projects will exhibit close connections between their conceptual, technical, and aesthetic dimensions.

UF grading policies website:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Participation

Participation, support, and respect in all phases of this course are imperative. The class dynamic depends on your energy, initiative, attitude, productivity, and willingness to get involved in group discussion and critiques. Participate in a responsive manner during critique and discussion. Complete all assigned readings and take notes so you can contribute to the discussion in class. Make safe and considerate choices with equipment and facilities. Become comfortable with the soldering lab. Do your part to keep the lab clean. Ask questions! Offer constructive feedback during group discussions, class workdays, and critiques. Reflect on the comments you receive to gauge the effectiveness of your work. Examine the way your ideas change, evolve and influence formal and conceptual choices in your work. Development as an artist often hinges on your ability to make effective choices and express your ideas clearly. Lastly: have fun and invent!

Attendance

Tardiness and/or lack of appropriate class materials are unacceptable and may count as unexcused absences. All students are expected to attend every class, prepared to participate. Up to three unexcused absences will be overlooked from a grading standpoint. On the 4th unexcused absence the Participation Grade drops by 50% (5 pts), the 5th at 100% (10pts) and 6th is failure of the course. Projects reflect learning, so you will succeed more easily with perfect attendance.
Please refer to UF attendance policies:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Final grades are based on:

- 15% - Project 1: Communication
- 15% - Project 2: Motion
- 15% - Project 3: Interaction
- 30% - Semester Project
- 25% - Attendance & Participation

Grading Scale

93 to 100 = A	73 to 76 = C
90 to 92 = A-	70 to 72 = C-
87 to 89 = B+	67 to 69 = D+
83 to 86 = B	63 to 66 = D
80 to 82 = B-	60 to 62 = D-
77 to 79 = C+	below 60 = E

Please note: a grade of C- or below will not count toward major requirements

Academic Honesty

Please do your own work, or you will fail. Students are expected to abide by the UF Academic Honesty Policy, which defines an academic honesty offense as "the act of lying, cheating, or stealing academic information so that one gains academic advantage."
Familiarize yourself with the academic honesty guidelines set forth by the University of Florida:

http://www.dso.ufl.edu/sccr/honorcode.php

Late Work

Grades for late assignments and projects will be penalized by a one letter grade drop. No work will be accepted after two class periods from the due date. Most of our work is done in-class and many of the issues you may encounter when working with these materials are more easily solvable together. Always attend class on project due dates. Even if you are not prepared to turn in your assignment, you still need to participate in discussion to receive project participation credit.

UF Media Labs Policy

Never bring food or drinks into the lab, not even water. Class periods will always include breaks so you can step outside. Save your work onto a portable drive before logging off. Files left on lab computers will be erased without warning through an automated service.

FAC 306 lab hours: http://plaza.ufl.edu/mchristo/306-schedule.html

UF Academic Technology lab hours: https://labs.at.ufl.edu/Hours.php

Evaluations

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/

Cell Phone Policy

UF requires all students have phones on silent, not off due to using this as an emergency notification system.

Accomodations for Students

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructorwhen requesting accommodation. Students with disabilities should follow thisprocedure as early as possible in the semester.

UF Counseling Center/ Counseling Services

Counseling and Wellness Center
3190 Radio Rd.
PO Box 112662
Gainesville, FL 32611-2662

Phone: (352) 392-1575.

http://www.counseling.ufl.edu/cwc/Default.aspx

UF Student Guide

This resource covers important policies and procedures for students:
https://catalog.ufl.edu/ugrad/current/Pages/academic-regulations.aspx

Health & Safety

Please familiarize yourself with the UF SA+AH Health and Safety Handbook, available online: http://arts.ufl.edu/art/healthandsafety. Sign and return the waiver distributed on the first day of class. You are responsible for helping maintain the safety of the labs, especially by keeping them clean and free of trash and debris. Pick up after yourself, or your final grade will be lowered at the instructor's discretion. Michael Christopher (mchristo@ufl.edu) is the area contact for health and safety issues. The following is an overview of the health and safety information specific to digital media art classes.

1.　　Hazards of Materials
Batteries, old monitors, lamps form digital projectors if broken may release mercury.
THERE ARE NO KNOWN HEALTH HAZARDS FROM EXPOSURE TO LAMPS THAT ARE INTACT.

2.　　Best Practices
Though not much is generated, the Digital Media technician is certified for handling Hazardous Waste by the University of Florida. For installations or sculptural elements, please cross-reference with other area specific information as needed.

3.　　Area Rules
- Follow all SA+AH Health and Safety handbook guidelines.
- Alcohol is not permitted (open or closed containers).
- No smoking in the building or within 50 feet of the entry.
- No eating or drinking in the lab.
- Shoes must be worn 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 impeded 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, follow dumpster guidelines.
- Flammable solid containers (red flip top) must have a yellow hazardous waste label on the outside (top).
- 5 gallon jugs must have a yellow hazardous waste label on the outside.
- 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.

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 to identify their contents. Labels can be found at the MSDS box in each studio and work area. 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. All unmarked containers will be disposed of with no notice.

Yellow: WHEN HAZARDOUS ITEMS ARE DESIGNATED AS TRASH. All containers must have a yellow label identifying the contents that are designated as trash for weekly EHS pick up.

Note: Hazardous Waste labels should include all constituents in the waste mixture as well as an approximate percentage of the total for that item and must add up to 100%. Labels should also include the Building and room number of the shop generating the waste along with the Waste Manager for your area, this is located on the SWMA sign posted at the sink or at the Waste Management Area.