



Honors Electronics and Electronic Objects for Art | ART 4645C | SYLLABUS

Number Credit Hours: 4

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Term: Spring 2018
Class Meeting Days: TR
Class Meeting Hours: 9:00-11:50
Class Location: SR

I. Course Description

The course introduces electrical and some mechanical engineering techniques for the purpose of making art. No previous knowledge of electronics, art, programming, or object-making is required. Students get a systematic introduction to building circuits with electronic components and ultimately make their own sensing and actuation devices. Readings and discussions on cultural issues surrounding electronic objects and environments accompany the technical instruction. The goal of the course is for students to develop both a technical and critical understanding of how electronic objects work and to use this understanding in the creation of new devices and products.

II. Course Prerequisites/Co-requisites

None

III. Course Objectives

- Students conceptualize and realize electronic objects on a beginner to intermediate level.
- Students articulate thoughts about electronic objects in art, culture, and design in written reading responses, in class discussions, in critiques, as well as through electronic art projects.

IV. Course Evaluation

Creative Assignments

Criteria for grading: In creative assignments I look for technical, visual, physical, and conceptual coherence. If a student takes a technical or conceptual risk, I will grade more leniently.

Assignment I: Switch

Build a normally open or a normally closed switch from found materials and/or objects. Deliverable: A switch that is not hooked up to any circuit.

Assignment II: Sensor Assignment.

Make a project using a resistive sensor. The project can be constructed out of paper, cardboard, etc. The physical shape of the project is part of the assignment.

Assignment III: Gear Mechanism

You will 3D print a set of gears that move via a motor. This mechanism will perform a task of your choice.

Assignment IV: Game controller

You will make an unconventional game controller and connect it to a computer game (in Processing/processing.org). Games are provided.

Assignment V: Electronic art object (Final Project)

Make a electronic art object. Due week 14 along with a video showing the object working/operating and explaining the concept.

Reading/Writing Assignments

Evaluation: In written responses, I look for critical and original thinking, and expect well-argued ideas.

Reading Assignment I

Read Chapter 1 “The Psychopathology of Everyday Things” from *The Design of Everyday Things* by Donald Norman (PDF and reading questions on Canvas).

Reading Assignment II

Read Chapter 2 “(In) Human Factors” from *Hertzian Tales* by Anthony Dunne (PDF and reading questions are on Canvas).

Participation

Participating in class means that you respond to prompts, ask (technical) questions, and participate in reading discussions.

How I evaluate participation:

You make excellent contributions to every class 100%

You contribute frequently 85-95%

You participate occasionally 75-85%

You only participated once 20%

I cannot remember that you ever said anything in class 0%

Final Grade Breakdown

| | |
|--|------|
| Switch | 5% |
| Blog | 10% |
| Sensor Assignment | 10% |
| Gear/Motor Mechanism | 10% |
| Game Controller | 10% |
| Electronic Object (Final Project) including demo video | 20% |
| Reading Assignment I & II | 10% |
| Quiz I | 5% |
| Quiz II | 10% |
| Participation | 10% |
| ----- | |
| Total | 100% |

VIII. Course Grading Scale

A =(100-93%) A-(92-90%) excellent

B+=(89-88%) B= (87-83%) B-(82–80%) Good

C+=(79–78%) C=(77-73%) Average

D =(69–60%) poor

F < 60% failure

XII. Attendance Policy

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance.

Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

You are permitted two unexcused absences. Beyond that, you are required to provide a doctor's note or other third party written excuse. If such notice is not provided, the final grade for the class will be reduced by 10 points on a 100-point scale. The same amount of points will also be deducted for repeated lateness or prolonged absences during class. This does not have to be physical absence but can also be lack of participation due to texting, social media consumption, sleeping etc. Late projects/assignments will not be accepted without a doctor's note or other acceptable third party written excuse.

XIII. Policy on Accommodations

In compliance with the Americans with Disabilities Act (ADA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures in Boca Raton, SU 131 (561-297-3880); in Davie, LA 131 (954-236-1222); in Jupiter and all Northern Campuses, SR 111F (561-799-8585) – and follow all SAS procedures.

XIV. Code of Academic Integrity Policy Statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

Academic Integrity in the context of an art class like this one means that the idea for any project you make in this class needs to be your own idea. You cannot take other people's creative output and pass it off as your own. Remixing and modding is encouraged if the remix or mod is based on an original idea by you. Therefore, you cannot take somebody else's project that has a similar concept to what you had in mind, make a few changes, and then claim that the project is yours. This especially applies to projects that make up more than 5% of your final grade. The "Algorithm" project needs to be written from scratch. Talk to me if you are not sure whether your project could be considered plagiarism. If your project contains large portions of code written by other people, you need to acknowledge their contribution in the source code. I also want to know if anyone helped you with your project and if yes, how much they helped. This should be disclosed either in the source code or elsewhere in the project. The same is true for writing assignments.

XV. Statement Justifying Honors Status

This course is an Honors course that differs substantially from non-Honors courses. The course fulfills the mission of the Honors College to develop in students the capacity to combine knowledge from different fields (e.g. art and electrical engineering) and apply it to the creation of original research. Students will be exposed to vocabulary of a specifically theoretical nature from both fields, and will be expected to comprehend these

new concepts and to deploy them in their own critical thinking, creative research, and in writing. The creative research and writing components of the course will employ Honors-level assessment standards, and are designed to prepare students for work on the **Honors Thesis**. This course will reflect the interdisciplinary nature of Honors education in that it will inculcate critical attitudes and skills to foster a self-directed approach to learning.

XVI. Course Outline

Week 1: Basic electricity, basic circuits.

Homework:

- Switch (practical assignment)
- Create a blog. Post URL of blog in discussion forum on blackboard.
- Document in-class exercises on your blog.
- From *Getting Started with Arduino* by Massimo Banzi read chapter 3 and chapter 4 up to page 40, paragraph 1.

Week 2: Measurements and basic sensing

Homework:

- Read Practical Electronics for Inventors. Section 2.2. and 2.3.
- Document in-class exercises on your blog
- Work through these tutorials
<http://www.ladyada.net/learn/arduino/lesson2.html> (quick read only) and
<http://www.ladyada.net/learn/arduino/lesson3.html> Document the results of the exercises on your blog including the code. If you need help, contact us via email or come to our office hours.
- From *Getting Started with Arduino* by Massimo Banzi finish chapter 4.

Week 3: Calculations

Homework:

- Calculations worksheet.
- Read from Practical Electronics for Inventors 2.8 (this is the same stuff as we covered in class – reading it will help you understand it).
- Sensor Project
- Read through the following web page:
<http://arduino.cc/en/Tutorial/DigitalPins>
<https://www.arduino.cc/en/Tutorial/AnalogInputPins>
<http://arduino.cc/en/Tutorial/PWM>
- Document in-class exercises on blog

Week 4: Reading discussion, project workshop

Homework:

- Sensor Project (due October 3)
- Read Practical Electronics for Inventors 3.4.0, 4.2.0., 4.2.1, 4.2.2. 4.3.2 (not the “Theory” section).

Week 5: Actuators

Homework:

- Document in-class exercises on blog
- Read the gears chapter from Mechanisms and Mechanical Devices Sourcebook (on Blackboard)
- Study for quiz.

Week 6: Actuators / Mechanisms & Mechanics. Quiz I

Homework:

- Build a gear mechanism (practical assignment Due October 24)

Week 7: Serial Communication & History of Entertainment Robotics I

Homework:

- Practical Electronics for Inventors sections 7.0, 7.1
- Document exercises on blog (as always)

Read <http://arduino.cc/en/Tutorial/Variables> <http://arduino.cc/en/Tutorial/IfStatement>
Read <http://arduino.cc/en/Tutorial/ForLoop> <http://arduino.cc/en/Reference/FunctionDeclaration>
<http://arduino.cc/en/Tutorial/SwitchCase2>
Read <http://www.ladyada.net/learn/arduino/lesson4.html>

Week 8: Programming workshop and some help with the Game Controller Assignment. History of Entertainment Robotics II

Week 9: Quiz Prep. Catch up.

Week 10 Individual Conversations (bring 3 ideas for a final project)

Week 11: Project workshop

Week 12: Project workshop

Week 13: Project workshop & Intro to Fritzing

Week 14: Project workshop

Finish Circuit and physical construction. Make video.

Week 15: Final Critique (Project + project video due)