

# Art of Making

## Syllabus

### COURSE DESCRIPTION

This course is a hands-on introduction to the technology and mindsets of making. Projects will introduce students to coding, engineering, and design thinking by leveraging tools like Arduinos, 3D printers, laser cutters, and more. Wearable tech, 3D printed boats, line-following robots, and electronic music instruments are just a few examples of potential projects created in this course.

### COURSE OBJECTIVES

1. Know how to safely operate the tools of the Makerspace, including the laser cutter, 3D printers, and soldering irons.
2. Understand and use basic electrical components, simple circuits, and circuit diagrams in the creation of physical, interactive prototypes.
3. Develop basic 3D modeling proficiency with CAD tools.
4. Develop an introductory-level understanding of object oriented programming, including data types, variables, control structures, and algorithms.
5. Communicate coding's enormous potential for innovation and creativity, as well as its applicability to a diverse set of careers and disciplines.
6. Understand and apply design thinking principles in the creation of digital or physical prototypes.

### GRADE BREAKDOWN

Grading will be on a point system.

- Homework, in class work: 10 to 20 points
- TED Talks: 100 points
- Projects valued at 300 points

The following percentages are an approximate representation of the grade breakdown:

- 15% - Class Participation
- 10% - TED Talk
- 15% - Homework
- 70% - Projects

### PROJECT EVALUATION

The following criteria are used to evaluate creative assignments:

1. **Meets Requirements:** Does the project follow directions and fulfill all aspects of the assignment? Are materials turned in on time?
2. **Correctness:** To what extent is your project free from errors or bugs?
3. **Design and Style:** To what extent is your code written well (i.e., clearly, efficiently, elegantly, and/or logically)? To what extent is your code readable (i.e., commented and indented with variables aptly named)? For physical prototypes- what is the level of craftsmanship?
4. **Creativity:** To what extent is the project unique, inventive, and imaginative?

5. **Complexity:** To what extent does the project demonstrate a mastery of the topic and an in-depth understanding of the material?
6. **Effort:** Is there evidence that you invested time and energy in the project?

### TED TECH TALKS

TED Tech Talks are weekly lectures given by students to educate the class about the diverse applications of coding, or important engineering topics that are not explored in The Art of Making. Potential topics include:

1. Quantum computing
2. Machine learning
3. Computer science in medicine, music (Max / Jitter, MIDI), art (Processing), or other fields
4. Wearable Tech (Raspberry Pi, Arduino, etc.)
5. Video Game Design
6. Virtual Reality

### LATE WORK POLICY

- Late homework will not be accepted.
- Late projects will be deducted 5 points for each day that the project is late.

### PLAGIARISM

In the age of the internet, and particularly in the realm of computer programming, it is very easy to copy/paste code.

- **For projects**, sharing code and building off of previous work is permissible, and even encouraged, so long as:
  - The code is open source.
  - You **give proper credit** by including a comment in your code with a URL or clear description of the source code. Credit is also required for “adapted” code.
  - The copied/adapted code **cannot make up a substantial portion** of the project.
  - **When in doubt, ask!**
- **Homework is different.** Unless noted otherwise, these assignments must be completed individually. Evidence of copying from other students or plagiarizing existing work may result in no credit, and possibly more serious consequences, as outlined by Newman’s academic policies on plagiarism.