

**New York City College of Technology**  
The University of New York

**Department of Entertainment Technology**

**MTEC 2280 – Ins and Outs**

Fall 2017, Tuesdays & Thursdays 4-5:40pm  
V-321

**Instructor:**

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Office hours: V-203, Tuesday & Thursday 6-7pm, and by appointment

**Description:**

An introduction to interactive technology with a focus on how we use technology to express ourselves and interact with our environment. This class combines a hands-on exploration of basic components of media, audio, and control circuits. Students also develop interfacing technologies from simple switches to multidimensional sensors, integrated circuits, and micro-controllers. Emphasis will also be placed on communicating between physical and digital systems.

**Recommended Texts:**

Patrick, Dale R. Fardo, Stephen W. Electricity and Electronics, A Survey, Fifth Edition. 2001.  
Williams, Elliot. MAKE AVR Programming. Media Maker. 2014.  
Banzi, Massimo. Getting Started with Arduino, 3rd Edition

**Attendance:**

Punctuality is one of the most respected virtues in the industry. If you have a reputation for showing up on time, you will always find people willing to trust you and to hire you. Use this class as an opportunity to build the habit of punctuality. It will be very difficult for you to learn the material if you are not in class. If you must come in late, please be respectful of the class and try not to disturb anyone as you enter. If you know ahead of time that you will be late or absent, please contact me before the start of class so we can arrange for you to make up material you will be missing.

Please refer to the latest student handbook for the university-wide policy on attendance.

**Academic Integrity Standards:**

You are responsible for reading, understanding and abiding by the NYC College of Technology Student Handbook, "Student Rights & Responsibilities," section "Academic Integrity Standards." Academic dishonesty of any type, including cheating and plagiarism is unacceptable. "Cheating" is misrepresenting another student's efforts/work as your own. "Plagiarism" is the representation of another person's work, words or concepts as your own.

**Learning Outcomes:**

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<b>After taking this class, the student will be able to...</b>	<b>This will be demonstrated by...</b>
Program basic visual applications in Processing	Tests, assignments
Recognize and use appropriate terminology for electrical systems and theory.	Tests, assignments, class participation
Measure Voltage and Resistance of components and circuits	In class demonstration
Recognize and use correct symbols on a circuit diagram	Tests
Perform calculations using Ohms Law and Power Law. Apply them in example electrical systems.	Tests, Homework assignments
Program micro-controllers	Tests, homework assignments
Build control circuits with analog and digital components	In class demonstration

**Grading:**

Participation/Attendance: 20%

Readings/Responses: 15%

Projects: 45%

Quizzes: 20%

## **Schedule:**

### **Week 1:**

Tuesday:

General technical setup, usernames, logins, etc.

Course Introduction

Pixel theory, color theory

Thursday:

Processing Lab

Homework:

Read Learning Processing Lesson One (ch 1-2)

Extra-credit: See Ian Cheng's work at MoMA PS1 and blog (with at least one photo you take)

### **Week 2:**

Tuesday:

Dynamic Processes with setup() and draw()

Introduction to System Variables with mouseX, mouseY

Random (Part I): random()

Thursday:

Processing Lab

Homework:

Read Learning Processing (ch 3-4)

Read Benjamin, Art in the Age of Mechanical Reproduction

Create a dynamic program that responds to the Benjamin text

### **Week 3:**

Tuesday:

Conditions with if()

Iteration with while() and for()

Projects & Artists: Sol Lewitt

Thursday:

Processing Lab

Homework:

Casey Reas, excerpt from Software & Art

Learning Processing (ch 5-6)

Re-create 3 Sol Lewitt Line Drawings using Processing

### **Week 4:**

Tuesday:

Introduction to Arduino

No class on Thursday

Homework:  
Read Banzi (ch 1-3)

**Week 5:**

Tuesday:  
Arrays  
Review of basic circuitry and breadboards

Thursday:  
Arduino Lab: Resistors, Buttons

Homework:  
Read Banzi (ch 4-6)

**Week 6:**

Tuesday:  
Arduino Lab: Making noise  
Projects & Artists: Laurie Anderson, Tristan Perich

Thursday:  
Arduino Lab: Making more noise

Homework:  
Read Banzi Appendix (p. 91+)  
Read The Art of Handmade Electronic Music by Nicolas Collins

**Week 7:**

Tuesday:  
Servo motors  
Lasers  
Arduino Lab: Making a cat toy

Thursday:  
Arduino Lab: Kinetic Sculpture (bring materials!)

Homework:  
Document your sculpture in a blog post  
Read Chapter 1 ELECTRICITY From Forest Mims' Getting Started with Electricity

**Week 8:**

Tuesday:  
Midterm checkin  
Processing review & Video

Thursday:  
Potentiometers  
Arduino Lab: Arduino -> Processing

Homework:

Seek out and write about 3 physical computing projects that you find interesting

**Week 9:**

Tuesday:

Quiz

Bluetooth

Thursday:

Arduino Lab: Wireless Communication

Homework:

TBA

**Week 10:**

Tuesday:

Serial

Processing -> Arduino

Thursday:

Processing/Arduino Lab: Software -> Hardware, Serial

Homework:

Propose a final project

**Week 11:**

Tuesday:

3d Printing

Artists & Projects: Morehshin Allahyari

Thursday:

3d Printing Lab: Robot arms

Homework:

Work on final project.

TBA

**Week 12:**

Topics. Work on final project.

Homework:

Work on final project.

TBA

**Week 13:**

Topics. Work on final project.

Homework:

Finish final prototype and presentation.

**Week 14:**

Due: Final project

Final Presentations.

### **Game Assignment 1:**

Create a simple game or simulation using custom cards of the same size. No dice, variations in card size or material, etc. The game should be able to be played in 5-15 minutes. In designing your own cards, please make them very legible and distinguishable. Artistry on the cards is optional and will not be graded.

The game must employ some or all of the following topics discussed thus far in class: procedural generation, randomness, simulation, emergent system, magic circle, meaningful play, etc. Emphasis on generative play.

1-4 players (or simulation)

5-15 minutes of play

Uniform sized custom cards (of any amount)

Clearly and fully document rules in a blog post

### **Game Assignment 2:**

Modify the game of Checkers to include narrative elements. Create a storyline for the game, including objectives, conflicts, exposition, etc. Explain how the basic game mechanics of Checkers fit into your story. Give it a title.

Ideas: Do certain areas of the board have special meaning? Do the individual pieces have desires? What characters or societies are involved? What would it mean for one side or the other to win?

Clearly describe your game in a blog post and include at least one sketch

### **Game Assignment 3:**

Create a game that uses its processes to make an argument. Give it a title. This game is open-ended and may be single player or multiplayer, cooperative or competitive.

5-15 minutes of play

This game may use a board, cards, uniform pieces

Clearly describe your game in a blog post, detailing the argument it intends to make