

New York City College of Technology

The University of New York

Department of Entertainment Technology

MTEC 2280 – Ins and Outs

- Fall 2019, Wednesday & Friday 10-11:40am
- Room V-321
- Instructor: Grayson Earle
- gearle@citytech.cuny.edu
- Office hours: 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.

Texts

- Schiffman, Daniel. Learning Processing, 2nd Edition
- Banzi, Massimo. Getting Started with Arduino, 3rd Edition
- Collins, Nicolas. Handmade Electronic Music, 1st 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.

Expectations

- Arrive on time and attend all classes - see above for attendance policy
- Spend at least 3-5 additional hours a week (outside of class) on class projects and exercises. Midterm and Final Projects may require additional time, depending on your ambition. Budget more time each week than may be needed
- Regularly check the GitHub repo for assignments, notes, etc.
- Regularly check Slack for group and private messages
- Maintain a well organized GitHub repository
- Actively participate in class discussions & group critiques

- Back up your work regularly, I will not be lenient for assignments lost due to not saving, corrupted drives, etc.
- Follow good device etiquette: No cell phone use during class. Laptops only used for lecture note-taking and related class activities
- Thoughtfully contribute to a positive classroom environment, while actively supporting and challenging your classmates' ideas
- Push yourself creatively and technically. Be ambitious. Work hard. Stay open and curious!

Learning Outcomes

- Program basic visual applications in Processing
- Recognize and use appropriate terminology for electrical systems and theory.
- Measure Voltage and Resistance of components and circuits
- Recognize and use correct symbols on a circuit diagram
- Program micro-controllers
- Build control circuits with analog and digital components

Grading

- Participation/Attendance: 20%
- Assignments: 30%
- Final Project: 30%
- Quizzes: 20%

Schedule

Week 1 (8/28 & 8/30)

- Wednesday
 - General technical setup, usernames, logins, etc.
 - Course Introduction
 - Pixel theory, color theory
- Friday
 - Processing Lab
 - Basic interaction & system variables
- Homework
 - Read Learning Processing Lesson One (ch 1-2)
 - Create a static drawing in Processing using 2d primitive shapes and colors

Week 2 (9/4 & 9/6)

- Wednesday
 - Dynamic Processes
 - Introduction to Random

- Variables
- KeyPress
- Friday
 - Processing Lab
- Homework
 - Read Learning Processing (ch 3-4)
 - Create a simple "drawing app" prototype based on the concepts we went over in class so far

Week 3 (9/11 & 9/13)

- Wednesday
 - Conditions with if()
 - Iteration with while() and for()
 - Projects & Artists: Sol Lewitt & Bridget Riley
- Friday
 - Processing Lab
- Homework
 - Read Casey Reas, excerpt from Software & Art
 - Learning Processing (ch 5-6)
 - Re-create 3 Sol Lewitt Line Drawings using Processing

Week 4 (9/18 & 9/20)

- Wednesday
 - Quiz
- Friday
 - Creating a Menu
 - State Changes
- Homework
 - Read Banzi (ch 1-3)
 - Create a sketch that has a menu system, which allows you to have at least three mini sketches within the same application. Feel free to work from previous sketches

Week 5 (9/25 & 9/27)

- Wednesday
 - Introduction to Arduino
 - Review of basic circuitry and breadboards
- Friday

- Arduino Lab: Resistors, Buttons
- Button Game
- Homework
 - Read Banzi (ch 4-6)
 - Re-create the Button Game in Processing, add your own spin to it

Week 6 (10/2 & 10/4)

- Wednesday
 - Projects & Artists: Laurie Anderson, Tristan Perich
 - Arrays & LEDs
- Friday
 - Arduino Lab: Making noise
- Homework
 - Read Banzi Appendix (p. 91+)
 - Create 3 different sounds using digitalWrite and other functions. DO NOT use a sound library, such as Tone. Each sound must be very different than the last.

Week 7 (10/9 & 10/11) * no class 10/9

- Wednesday
 - Arduino Lab: Making more noise
- Homework
 - Read The Art of Handmade Electronic Music by Nicolas Collins
- Homework
 - Read Chapter 1 ELECTRICITY From Forest Mims' Getting Started with Electricity

Week 8 (10/16 & 10/18) * no class 10/16

- Friday
 - Mid-term check-in
 - Potentiometers
 - Arduino Lab: Arduino -> Processing
- Homework
 - Seek out and write about 3 physical computing projects that you find interesting

Week 9 (10/23 & 10/25)

- Wednesday
 - Servo motors (and Arduino libraries)
 - Lasers

- Serial communication
- Arduino Lab: Making a cat toy (2-axis laser, controlled via Processing)
- Friday
 - Arduino Lab: Automating your cat toy
 - Review
- Homework
 - Draft a final project proposal

Week 10 (10/30 & 11/1)

- Wednesday
 - Quiz
- Friday
 - Serial: Arduino -> Processing, or Hardware -> Software
 - Video playback in Processing
- Homework
 - Refine final project proposal based on discussion

Week 11 (11/6 & 11/8)

- Wednesday
 - Potentiometer servo control with robot arms
- Friday
 - Processing/Arduino Lab: Software -> Hardware, Serial
 - Setting variables in Arduino via KeyPress in Processing
- Homework
 - Work on final project

Week 12 (11/13 & 11/15)

- Wednesday
 - Sensor lab
- Friday
 - Special topics
- Homework
 - Work on final project

Week 13 (11/20 & 11/22)

- Soldering workshop
 - Thinking about building permanent installations

- Work on final project

Week 14 (11/27 & 11/29)

- Special topics
- Work on final project

Week 15 (12/4 & 12/6)

- Special topics
- Work on final project
- Homework
 - Finish final prototype and presentation

Week 16 (12/11 & 12/13) * no class 12/13 for reading day

- Due: Final project
- Final Presentations