



Winterim Course

The Internet of Things:

Create your Internet Enabled Large Format Drawing Machine

Dates: December 3–6, from 9am to 5pm

Instructors: Petra Bonfert-Taylor, Rich Crowley, Mark Franklin (coordinating instructor), Jane Reynolds, Dan Safford, and Ben Servoz

Intended Audience: Open to anyone in the Dartmouth community, priority given to art students or students with a drawing project in mind.

Prerequisites: No engineering or programming experience needed, willingness to learn electronics and the Python programming language.

Description: It has become commonplace for devices to be connected to the Internet; the possibilities for novel Internet-connected devices are endless. Perhaps a US Mail mailbox that texts its owner when mail is delivered and sends a picture of its contents? Or maybe an activity monitor that allows TV viewing only after the viewer has gotten enough exercise? With possible applications ranging from practical to fun to whimsical, it is clear that this will be an area of intense innovation for some time.

This mini-course will guide students through building an internet-connected [Drawing Machine](#) they can keep for their own art projects. They will:

- discover [Raspberry Pi](#)
- learn the basics of Linux and command line
- learn the basics of the Python programming language
- wire circuits on a breadboard
- introduce the technologies that make these devices work with the Internet (HTML, HTTP, web browsers).
- provide hardware & software building blocks and guidance on putting them together

We will deliver most “lecture” type material via interactive slides (LCS) on the Raspberry Pis themselves.

We will measure:

- Progress and understanding via the questions they ask and feedback they provide to questions we pose with Live Class Survey
- Success implementing the hands-on steps
- Feedback on the course via surveys during and after the course

Rough outline of daily schedule:

Day 1: Wire simple circuit Control from Linux Learn Python basics Control from Python Stepper motor

Day 2: Another stepper motor Build drawing machine Math & programming of movement through coordinate system

Day 3: Wiring and programming servo motor for Pen up and down Drawing with GCode & Turtle graphics Tools & ideas for generating drawings

Day 4: Drawing, practice & adjustments