COURSE CALENDAR DESCRIPTION

Explores embodied approaches to combining hardware, software and materials to create art works. Students will be introduced to the world of physical computing: combining simple computers (e.g. Arduino), sensors, LEDs, motors etc. in physical forms. Prerequisite: Second year standing or permission of the course director.

CCE: FA/FACS 3933 3.00

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INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
<th>Contact Phone</th>
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<tbody>
<tr>
<td>Hughes, Dafydd</td>
<td>Sec. A / STDO / F</td>
<td><a href="mailto:dafyddh@yorku.ca">dafyddh@yorku.ca</a></td>
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SPECIAL FEATURES

Course Consultation Hours: Thursdays 1pm, by appointment

In this course students will develop a fundamental understanding of Arduino (arduino.cc) and basic electronics in order to realise original projects. While much attention will go into the nuts and bolts of developing with Arduino and working with sensors, actuators and other electronic transducers, assignments and technical concepts will be contextualized in the field of media arts, with particular interest in connecting virtual logic with physical spaces.

TOPICS AND CONCEPTS

- Bridging the physical and digital worlds
- Coding for physical interaction
- Basic Electronics
- Sensors and physical output devices
- Interfacing computes and microcontrollers
- Fabrication

Sep 7

Introduction
- Bridging the gap between computers and the world
- Intro to Arduino

Assign: Rube Goldberg Machine
Sep 14
Electricity basics: Ohm’s law
Arduino workshop 1
- Analog in, digital out
- Arduino programing: variables, math, counting

Sep 21
Electricity 2
Arduino workshop 2
- Digital in, analog out
- Arduino sketch logic: Conditionals, loops, functions
Lab 1

Sep 28
Interfacing with Max/MSP/Jitter
- Serial communication
Quiz 1
Lab 2

Oct 5
Rube Goldberg Machine presentations
Soldering
Due: Rube Goldberg Machine

Oct 12
Robots Workshop I
Design thinking workshop
Assign: Final Project, Final Project Proposal

Oct 19
Robots Workshop II
Final project proposal discussion
Due: Final Project Proposal
Lab 3

Oct 26  Reading Week - no classes

Nov 2
555 Timer workshop
Schematics & Data Sheets
Lab 4

Nov 9
Final Project Refinement
LIST OF LEARNING OUTCOMES AND EXAMPLES OF

1. By the end of this course, students will be able to:
   • Conceive, plan and execute a design or art project that bridges technology and the physical world
   • Write clean, elegant code for the Arduino microcontroller platform
   • Build working analog and digital input and output circuits
   • Describe the purpose and correct usage of electronic components including resistors, capacitors, LEDs, transistors
   • Use Ohm’s and Kirchhoff’s Laws to design and debug simple circuits
   • Interface the physical world to computers using Max/MSP and/or Processing
   • Solder basic electronic circuits
   Read and effectively use the information in schematic diagrams and component data sheets

GRADED ASSESSMENT

Rube Goldberg Machine (individual) 5 Oct 20
Final project proposal (group) 19 Oct 10
Final project (group) 30 Nov 25
Labs (individual) 21 Sep, 28 Sep, 19 Oct, 2 Nov 20
Quizzes (individual) 28 Sep, 9 Nov, 23 Nov 15
Participation (individual) 10
Total 100

ADDITIONAL INFORMATION

Last date to drop this course without receiving a grade: November 10, 2017

Important Course Information For Students

All students are expected to familiarize themselves with the following information:

• Academic Honesty Policy and Procedures
  Academic Integrity Website - http://www.yorku.ca/academicintegrity.

• Accessibility/Disability Services: course requirement accommodation for students with disabilities, including physical, medical, learning and psychiatric disabilities www.yorku.ca/cds.
Accommodating Students with Disabilities (York Senate Policy)
Ethics Review Process for research involving human participants
- Religious Observance Accommodation
  https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regoobs

Grading Scheme and Feedback Policy
The Senate Grading Scheme and Feedback Policy stipulates that (a) the grading scheme (i.e. kinds and weights of assignments, essays, exams, etc.) be announced, and be available in writing, within the first two weeks of class, and that, (b) under normal circumstances, graded feedback worth at least 15% of the final grade for Fall, Winter or Summer Term, and 30% for ‘full year’ courses offered in the Fall/Winter Term be received by students in all courses prior to the final withdrawal date from a course without receiving a grade.

Important University Sessional Dates (you will find classes and exams start/end dates, reading/co-curricular week, add/drop deadlines, holidays, University closings and more.
http://www.registrar.yorku.ca/enrol/dates/index.htm

*"20% Rule"
No examinations or tests collectively worth more than 20% of the final grade in a course will be given during the final 14 calendar days of classes in a term. The exceptions to the rule are classes which regularly meet Friday evenings or on Saturday and/or Sunday at any time, and courses offered in the compressed summer terms.

Many courses utilize Moodle, York University’s course website system. If your course is using Moodle, click here to access it.
Moodle @ York University