DES-INV 23

Creative Programming & Electronics

TU, TH 11:00 am - 12:29 pm
Jacobs Hall 220

Instructor	Kuan-Ju Wu
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Office/hours	CITRIS Invention Lab/ Tue 1 - 4pm
Course site	sites.google.com/site/desinv23/

COURSE DESCRIPTION

In this course, we will explore the creative and expressive nature of computational approaches to art and design. We will approach writing code like creative writing, to tell a story or to express our feelings. We will build machines like creating artworks, to embrace failure and to adventure into the unknown.

During the course of the semester, you'll learn how to write code for a variety of visual projects including generative graphics, interactive animation, and live performance. We'll primarily be using the Processing, an open-source graphical library and integrated development environment (IDE) / playground built for the electronic arts, new media art, and visual design communities, and a brief exploration of Arduino/Firmata as a tool for extending Processing into the physical world.

Along the way, we'll also look at a variety of completely strange, whimsical, and beautiful works created by historical and contemporary artists / technologists, and we will re-think computation from a poetic, provocative perspective.

PREREQUISITES

This course has no prerequisites. It pairs well with DES INV 22: Prototyping & Fabrication I, but the two courses can be taken in either sequence, or individually.

ATTENDANCE

This course contains a great deal of technical material and creative information, and because our process of experimentation and critique is collaborative, attendance is mandatory. You are allowed two absences for the semester without penalty (except critique days and design showcase); – each additional absence will result zero credit for the missed studio. To receive an additional excused absence, you must ask in advance, and receive an acknowledgment from the instructor. Excusable absences include family emergencies, job interviews, and presenting at a conference. To receive credit for attendance, you must arrive on time. No late assignments will be accepted. For any absence, it is the student's responsibility to inquire with classmates for notes, make up any exercises completed in class, and to complete impending assignments.

" For us, computation is poetic when technology is used for critical thinking and aesthetic inquiry – a space where logic meets electricity (hardware), math meets language (software) and analytical thinking meets creative experimentation. "

- School of Poetic Computing

HOMEWORK

Homework in this class is meant to be exploratory, a way to expand on the experiences and ideas in class. I encourage wide-ranging interpretation of assignments: consider ways that you can complete the project that are creatively and intellectually exciting for you, not fulfilling the basic requirements. (That said, some assignments will have restrictions on them – these kinds of constraints can spur creativity, so embrace them!)

You should expect the material to be rigorous and thorough. Unlike tests, projects require considerable engagement and thoughtful work on your own, and I want to see you working each week on projects. All assignments are due by the start of class and should be turned in on Google Drive – details of projects will be available on the class page (see link on the first page of this syllabus) including details about how to turn in specific projects, what's to be included, etc.

REQUIRED MATERIALS

+ Maker Pass for accessing prototyping and electronics labs in Jacobs Hall and the CITRIS Invention Lab ($75)
+ A custom kit of electronics, designed for this course ($100)
+ Laptop capable of running Processing/Java and with reliable internet connection, plus a charger – Always bring your laptop to class, please!
+ A notebook or sketchbook for taking notes and drawing ideas – bring every week, too!
+ Required and suggested readings will be provided as PDFs on the course site – there is no required textbook.

GRADING

The goal of all assignments is for you to think and make. Everyone comes from a different background and experience, so I'll be looking for improvement, curiosity, engagement, and a willingness to experiment. A grading rubric will be provided with each assignment to help you understand what is expected and how you did.

To get a C (an average grade) you should:

+ Put time into your projects each week
+ Complete everything on time
+ Participate in critiques and discussions

For a B or an A, you should additionally:

+ Take risks and try things enthusiastically
+ Be an active and unsolicited participant in critiques and discussions
+ Take assignments beyond their minimum requirements

Final grades will be determined as follows:

+ Class participation: 20%
+ Homework: 30%
+ Midterm project: 15%
+ Final project: 35%

PRONOUNS

As this course includes lots of interaction between students, it's important for us to create an environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronouns and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform me of the necessary changes.

COURSE CALENDAR

Please note this is subject to change – be sure to check this page and your email regularly. Homework and readings are listed for the days they are assigned.

Jan 22	**Introduction** Course Overview & Introduction **Drawing & Coordinate System** Activity: Processing IDE, setup, fill, stroke, drawing shapes, position, Github Homework A: Sign up for Maker Pass, complete basic workshop safety training. (Due Jan 24) Homework B: Monster Portrait (Due Jan 31)
Jan 24	Seminar + Homework Review
Jan 29	**Iteration & Loops** Activity: For Loop, Nested Loop, Functions, Push/PopMatrix, Translate, Rotate Homework: Design of Quilt (Due Feb 7)
Jan 31	Seminar + Homework Review
Feb 5	**Oscillation & Random** Activity: Cos/Sin, Random, Map, Constrain, Noise, Screen Record Homework: Robot's dream animation (Due Feb 14)
Feb 7	Seminar + Homework Review
Feb 12	**Interactivity** Activity: Mouse / Keyboard Event, Velocity, Acceleration, Force, PVector Homework: Little Creatures Animation (Due Feb 21) Optional Event: Tampa Processing Community Day P5.js jointed Workshop at 3pm
Feb 14	Seminar + Homework Review
Feb 19	**Video Manipulation** Activity: Movie, Camera, Images Homework: Fractions of Memory (Due Feb 28)
Feb 21	Seminar + Homework Review
Feb 26	**Digital Input & Condition** Activity: Arduino Firmata, Switch Homework: Hack a Toy (Due Mar 7)
Feb 28	Seminar + Homework Review
Mar 5	**Analog Input** Activity: Analog Sensor Input, Potentiometer, Mic Input Homework: Midterm Ideas Proposal ((Due Mar 14))
Mar 7	Seminar + Homework Review

Mar 12	Worksession
Mar 14	Seminar + Homework Review
Mar 19	Worksession
Mar 21	**Midterm Critique**
Mar 26	Spring Recess - no Class
Mar 28	Spring Recess - no Class
Apr 2	**Digital Output** Activity: LED, Relay, Solenoid, Servo Homework: Enchanted Objects (Due Apr 4)
Apr 4	Seminar + Homework Review
Apr 9	**Analog Output** Activity: PWM, Motor, Transistors Homework: Final Project Idea Proposal (Due Apr 18)
Apr 11	Worksession
Apr 16	**Let the Light Shine** Activity: LED Strip
Apr 18	Seminar + Homework Review
Apr 23	Worksession
Apr 25	Dry Run
Apr 30	Worksession
May 2	**Final Critique**
TBD	**Jacobs Design Showcase**