Syllabus

HCI 574 - Computational Implementation & Prototyping in HCI (Spring 2024)

- **Instructor**: Chris Harding: charding@iastate.edu **Book help session (MWF 3:30 - 5:00**)
- **Teaching Assistant:** Sailesh Gautam sg2187@iastate.edu
- **Credits**: 3 (mixture of lectures and practical exercises)
- **Reference number** for HCI 574X section A (on-campus section): 9226005
- **Reference number** for HCI 574X section XE (off-campus section): 9226600.
- **Schedule:** here
- **Course Cybox folder**: https://iastate.box.com/s/xsgtkzth7omcps3w2g0k9wyxqdefcc2q
- **Room**: **1226**, Howe Hall (MWF 2:15 to 3:05)

Teaches the fundamentals of the Python programming language for computational thinking and rapid system prototyping in the context of human computer interaction (HCI).

The course is (primarily) meant for non-technical HCI students (psychology, business, design, sociology, education, journalism, etc.) to "think like programmers" and to help them develop solutions for problems common in HCI. Python is a good high-level starter language that supports the rapid implementation of computational HCI tools, such as user interface design, and information visualization. HCI 574 does prepare for the project-based HCI 584 (Python Application Development in HCI), which counts as an HCI Implementation course and is given every Summer. Contact me or Tiffany Kayser to learn more about HCI 584.

There may also be students already with a general programming background who want to specifically learn Python. Be advised that I will take it initially pretty slowly. You may primarily benefit from using some of the many python modules to write application code, which we'll do after the midterm.

The lectures will feature practical examples and exercises, all using Jupyter notebooks to be run inside Visual Studio Code. Students will code during class and will need a personal laptop (Windows, Mac, Linux) with Python installed. The course will include homework assignments and a midterm exam but no final exam.

Course content/major topics:

- Creating, editing and running Python programs (primarily using jupyter with Visual Studio Code).
- Python basics: Statements, syntax, expressions, control structures, classes, functions, methods, modules, numbers, strings, lists, dictionaries.
- Object oriented programming (OOP)
- File I/O operations.
- Documentation and programming style tips
- Data mining & internet scripting.
- Design of graphical user interfaces (GUIs) using TkInter
- Information visualization (incl. maps)
- 2D graphics and image processing
- Web-related programming (HTML, web app, RSS feeds)
- 3D graphics
- Data Science and Pandas Dataframes

last changed: Jan 18, 2023

Syllabus

HCI 574 - Computational Implementation & Prototyping in HCI (Spring 2024)

Textbook (all free, all optional):

- Think Python: How to Think Like a Computer Scientist by Allen B. Downey (use the version for Python 3!)This is a good companion book to the material I'll go over, especially for beginners, who might benefit from reading about some concepts in a different way.
- Python for Everybody (PY4E) https://www.py4e.com/lessons Lessons are meant for total beginner but eventually look at more complex topics, such as data visualization (Note: parts may be pretty old)
- The book "Automate the boring stuff with Python" (Al Sweigert, no starch press, 2015) deals with python applications, similar to those we will go over in the second part of the course. The **free html** version (with code) is here: https://automatetheboringstuff.com/

Lectures:

- Before each lecture, download the current lecture **folder** from the HCI574_course_folder and copy it in a "personal" HCI574 folder you made under Box, or locally. It will contain lecture notes as a jupyter notebook (.ipynb) plus sometimes data files (text, images, etc.) Note that you cannot run notebook files directly, you have to load it into Visual Studio Code. But, I will typically also give you a "static" html rendered version of the notebook which you can view with in your browser.
- If you are an online student you can watch it live via WebEx or a recording later via Echo360. The recording will be available about 2 hrs after the lecture finished.
- All students can watch the recorded videos via Echo360. However, if you're an on-campus student, I very much encourage you to attend the class in person so you can ask questions! I will typically stick around for a bit after the lecture, so feel free to ask me about the homework, etc. or to help you with trouble shooting.

Class schedule:

- Here - shows each lecture's topic and HW assignment dates.

Programming during lecture:

- We will do a lot of "let's try this in python" during the lecture and run snippets of code in a python environment called jupyter
- There will be a jupyter notebook with many code snippets for each lecture that you can run to see the effect of the code. We will also often change the initial code and see what happens!
- I assume you're editing/running the jupyter notebook together with me.
- Please bring a laptop with Python and Visual Studio Code installed to class. (HW0 contains all the install instructions)
- Online students should run the code snippets when watching the lecture recording.

Homework assignments (graded, capped at 142 pts)

- Assignments and their instructions will be on Canvas (HW0, HW1, ..., HW10)
- due: 1 week after given **at the end of the day** (see schedule)
- deductions for lateness (unless you told me a good reason beforehand)
- Deliverables: **working** jupyter notebook (more details about that later)
- Besides your grade, you will get a file with potential feedback from the TA.

last changed: Jan 18, 2023

- Many HW's will have optional points. Thus total HW points might add up to more than 142 but will be capped to 142 when calculating your final grade

Providing homework help

- Ideally you should be able to solve the HW assignments based on what we did during the lectures and specifically by going back and looking at the notebooks we worked on during the lecture.
- I encourage you to work through the assignments with other students - **as long as you're truly collaborating and not simply copying!**
- I will stick around directly after each class to help on-campus students. I also have virtual office hours directly after each lecture (3:30 - 5), but you must use this website to make an appointment first!
- Use Piazza Q&A. There's a channel for each HW, for install help and for general questions.
- Other students are encouraged to help, but please do not simply post your solution! Instead act as a tutor and just give suggestions or point out issues.
- You can also post an anonymous question or a direct message to the instructors.

TA & office hours:

- Sailesh Gautam sg2187@iastate.edu
- Office hours: Thursdays 5 pm to 6 pm
- **Online** only: Teams Link

Midterm (graded, 35 points)

- Larger assignment similar to previous HW questions
- You are not allowed to collaborate!
- You have one week to complete the midterm, it is not proctored.
- Material: anything from lectures 1 through 20 and HW 1 through 5
- Has 5 buffer points i.e. you can not get 5 points and still get an A for this assignment

Participation (graded, 2 points):

- Lecture feedback (1 pt each): Give me at least 2 short feedback posts in the L**ecture Feedback assignments** on canvas. (1 before midterm, 1 before final exam)
- 1-2 paragraphs or a couple of bullet points about a lecture, such as:
  - Summarize what you learned in today's lecture, or
  - Ask follow up questions about the lecture material (or even more general), or
  - Something you hated or didn't understand at all and how I could have done better, or
  - How you might use the lecture material in "your world".

Course Evaluations:

- If > 75% of students fill out the Class Climate Evaluations at the end of the semester, **all students will get 5 pts.**
- Note that I'm serious about the 75%. I've had semesters in the past where 73% did the evaluations and nobody got the extra 5 points.

Syllabus
HCI 574 - Computational Implementation & Prototyping in HCI (Spring 2024)

Grading Scheme:

%	Need more than pts	Final grade
95	170	A
90	161	A-
85	152	B+
80	143	B
75	134	B-
70	125	C+
65	116	C
60	107	C-

Legal Stuff: see the Syllabus Statement link on the left side on Canvas

last changed: Jan 18, 2023