PSY P357: Thinking Like Machines
Fall 2022 Syllabus

CLASS TIME AND PLACE

Section #11613

In-Person Discussions, Monday and Wednesday, 10:20 AM – 11:35 AM in PY 226

INSTRUCTOR INFORMATION

Instructor: Rick Hullinger
Office: ~~PY A300B~~ Online only this semester
Office Hours via Zoom:
Monday 12:00 PM – 2:00 PM
Tuesday 1:00 PM – 3:00 PM
Or by appointment
Office Telephone: 812-856-6854
Email Address: rahullin@iu.edu

COURSE GOALS

This course is designed to help you think the way a computer does: to break a big problem down into smaller parts and then use logic and a systematic approach to achieve solutions. It will provide skills that will help you in your future classes and help you think more clearly about our increasingly technologically saturated world. You'll be empowered to explore and learn about a range of technologies that will benefit you in in school, research, and your future career. These same skills will also make it easier to understand how computers work and by the end of the course you will be comfortable writing your own small computer programs. It is intended for first- and second-year undergraduate students with no prior programming experience. This is not a course focused on teaching you how to program in a specific language. Instead, it will teach you how think about programming so that you can pick up whatever programming language you need much more quickly in the future.

This course will be challenging. However, the tests and assignments are designed so that any student who is willing to put in the time to digest the course content, work hard outside of class, develop and use good study strategies, and contact the me when they are struggling, can develop a thorough understanding of the material and ultimately succeed in the course.

In this course, successful students will be able to:

- Use both local and online resources to solve problems, learn new skills, and answer questions
- Differentiate between various computational environments (local, remote, cloud) and select an appropriate environment for specific tasks
- Demonstrate the tenants of algorithmic thinking: decomposition, pattern recognition, abstraction, and algorithm creation with both human-centered and computational tasks.
- Write clear pseudocode for solving a variety of problems
- Use the fundamental structures of programming languages to write, document, and debug simple python programs
- Confidently approach new technologies, software, and programming languages with the skills and knowledge necessary to learn them quickly.

STUDENT SUCCESS

I care about the success of *every* student in this class. When you have questions about the course material, questions about the subject more broadly, concerns to discuss, accommodations you need, or thoughts you want to share, please reach out to me. I am here to help you succeed.

Many students face obstacles to their education because of work or family obligations or unforeseen personal difficulties. If you are experiencing challenges throughout the term that are impacting your ability to succeed in this course, or in your undergraduate career more broadly, please let me know as soon as possible so that we can work together to form a plan for your academic success.

TEXTBOOK & COURSE MATERIALS

We will not be using a textbook for this course. All the readings and notes that you need will be presented in class and/or provided for you on Canvas.

LECTURE PARTICIPATION

Most class session will be held in person, in PY 226, from 10:20 AM – 11:35 AM, ET (Indiana time). Class periods will be a mix of lecture, discussion, demonstrations, and collaboration. Attendance and active participation in these sessions will be tracked and will make up your class participation score.

Each student will have their five lowest lecture participation scores dropped. Because each student gets five dropped scores, I do not make a distinction between excused and unexcused absences. If you miss a class due to illness, oversleeping, travel, or emergency, participation for that session will be recorded as a zero.

HOMEWORK

Most weeks of the semester will have a new homework assignment posted on Wednesday after class. The assignment will focus on the concepts, skills, and technologies we have studied that week. All assignments will be due at least one week after they were assigned (typically at 11:59 PM the following Wednesday). Each student will have their lowest homework assignment dropped. Late homework will not be accepted.

EXAMS

There will be two cumulative, in-class exams this semester (see the course schedule for details). These exams will cover the same material as the homework assignments, but you will not be required to use any software (or produce working code) for the exams.

FINAL PROJECT

Each student will complete a final project which may be either:

- Two pre-defined python coding projects that will make use of the skills you've learned over the semester or
- A single, choose-your-own-adventure (student-defined) coding project exploring some new aspect of algorithmic thinking and programming.

I will provide more details on the final project nearer the end of the semester and will give considerable guidance throughout the process.

If you have a scheduling conflict that will interfere with turning in a homework assignment or taking an exam at the scheduled time, you must let me know as soon as possible. With the exception of extreme and unforeseen circumstances, contacting me the day (or even worse, after) an assignment or exam is due will be considered an unexcused absence and will result in a zero on the late work.

GRADING

Your final grade is computed using the following formula:

Lecture Participation:	15%
Homework Assignments:	35%
Exam 1:	15%
Exam 2:	15%
Final Project:	20%
	100%

GRADING SCALE

A+: 97.0%-100%;	A: 93.0%-96.99%;	A-: 90.0%-92.99%
B+: 87.0%-89.99%;	B: 83.0%-86.99%;	B-: 80.0%-82.99%
C+: 77.0%-79.99%;	C: 73.0%-76.99%;	C-: 70.0%-72.99%
D+: 67.0%-69.99%;	D: 63.0%-66.99%;	D-: 60.0%-62.99%
F: Below 60%		

RELIGIOUS AND CIVIC OBSERVANCES

Students missing class (lecture, workshop, or exam) or needing an extension for a religious observance can find the officially approved accommodation form by going to the Vice Provost for Faculty and Academic Affairs webpage for religious accommodations. The form must be submitted at least 2 weeks prior to the anticipated absence.

STUDENT RESPONSIBILITY

It is your responsibility to double-check your assignment and exam grades – both that the assignments themselves were correctly graded and that the scores posted on Canvas match your actual grades. You have two weeks from the time an assignment or exam is returned to the class to address any grading issues. After that, the grades posted on Canvas will be considered final.

HEALTH AND SAFETY

IU is following recommended public health guidance in response to the pandemic. In recognition of all IU community members owe to each other, we expect every member of the IU community will adhere to all current policies and practices. For current information on that guidance see https://covid.iu.edu. Students are expected to follow the university directives and the classroom policies established by their instructors. Willful non-compliance with campus or instructor policies will be considered personal misconduct and will be handled following the procedures outlined in the Student Code of Conduct.

EXTRA CREDIT?

Extra credit points will occasionally be offered as a bonus for solving additional homework problems. Outside of those extra challenges, no extra credit will be available.

EMAIL

I expect you to be checking your IU email account (not just Canvas messages) no less than once a day. I will send frequent messages to the class with announcements, clarifications, instructions, and/or updates. You are responsible for the content of these messages exactly as if the material had been presented in class. Saying that you have not checked your email for a few days will not be considered a valid excuse for missing information. All class-wide messages will be sent using the Canvas Announcement tool, so archived messages can always be found on the Canvas site.

FEEDBACK

Do not wait until the end of the semester course evaluations to let me know that I could be doing something better. Tell me as soon as possible so that I can make the class valuable and relevant as we go along. If you have any feedback, good or bad, about the course or how it's being taught, please feel free to send it to me *anonymously* using this link.

ACADEMIC HONESTY

This course is conducted under the University's Ethics Code. Specifically, it is considered cheating if you obtain any kind of information about answers and solutions to the assignments in this course – exams and homework – from any non-intended source or conversely transfer such information to others.

You are welcome to use outside sources (the internet, friends, etc.) to solve programming problems. Everyone who writes software does this. What you cannot do is use logic, code, or solutions to problems without fully understanding how they work. This is a class about thinking and understanding, not copying working solutions. Submitting any code or homework solution that you do not understand or cannot explain will be considered academic misconduct.

It is also considered academic misconduct if you lie to me about an absence or extension relating to a homework assignment or an exam. The punishment for academic misconduct will be no less than a zero on the assignment or exam and will likely be **failure of the course**. As per university policy, *all* incidents of academic misconduct must be reported to the Dean of Students office.

CLASS RECORDINGS

I will record each class session and upload the recording to our Canvas site after class. You may watch any of the recordings online or download them for off-line viewing on your computer, smartphone, or media player. These recordings are copyrighted by me and provided by me and the University for your personal use. You may not share them, in whole or in part, without my prior written permission. Please see the copyright statement below for the full terms of use.

ACCESSIBILITY AND ACCOMMODATION

Indiana University is dedicated to ensuring that students with disabilities (e.g., chronic health, neurodevelopmental, neurological, sensory, psychological & emotional, including mental health, etc.) have the support services and reasonable accommodations needed to provide equal access to academic programs. To request an accommodation, you must establish your eligibility by working with Disability Services for Students (iubdss@indiana.edu or 812-855-7578). Additional information can be found at accessibility.iu.edu. Note that services are confidential, may take time to put into place, and are not retroactive; captions and alternate media for print materials may take three or more weeks to get produced. Please contact your campus office as soon as possible if accommodations are needed.
The office is located on the third floor, west tower, of the Wells Library, Room W302. Walk-ins are welcome 8 AM to 5 PM, Monday through Friday. You can also locate a variety of campus resources for

students and visitors that need assistance at: https://ada.sitehost.iu.edu/

SEXUAL MISCONDUCT AND TITLE IX POLICY

As your instructor, one of my responsibilities is to create a positive learning environment for all students. IU policy prohibits sexual misconduct in any form, including sexual harassment, sexual assault, stalking, sexual exploitation, and dating and domestic violence. If you have experienced sexual misconduct, or know someone who has, the University can help.
If you are seeking help and would like to speak to someone confidentially, you can make an appointment with:

The Sexual Assault Crisis Services (SACS) at (812) 855-5711 (counseling services)
A Confidential Victim Advocates (CVA) at (812) 856-2469 or cva@indiana.edu
IU Health Center at (812) 855-4011 (health and medical services)

It is also important that you know that University policy requires me to share certain information brought to my attention about potential sexual misconduct, with the campus Deputy Sexual Misconduct & Title IX Coordinator or the University Sexual Misconduct & Title IX Coordinator. In that event, those individuals will work to ensure that appropriate measures are taken and resources are made available. Protecting student privacy is of utmost concern, and information will only be shared with those that need to know to ensure the University can respond and assist. I encourage you to visit http://stopsexualviolence.iu.edu/index.html to learn more.

BIAS-BASED INCIDENT REPORTING

Bias-based incident reports can be made by students, faculty and staff. Any act of discrimination or harassment based on race, ethnicity, religious affiliation, gender, gender identity, sexual orientation or disability can be reported through any of the options:

1) fill out an online report at https://reportincident.iu.edu
2) email biasincident@indiana.edu ;
3) call the Dean of Students Office at (812) 855-8187.

Reports can be made anonymously.

COPYRIGHT

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GROUPME AND OTHER EXTERNAL MESSAGING PLATFORMS

Please note that you may receive emails from other students about joining GroupMe (or similar external group messaging platforms) for individual classes via Canvas. Even though invitations to join these groups may be issued through Canvas, they do not imply my endorsement. While apps like GroupMe can be an effective tool for keeping in touch with classmates and clarifying information related to the course, they can also be a source of unauthorized information sharing or collaboration among students. Collaborative efforts on assignments, quizzes and exams, including sharing or discussing answers when the instructor has not expressly authorized collaboration is considered cheating. If academic dishonesty

occurs via GroupMe or similar messaging platforms, everyone involved in the thread may be found responsible for academic misconduct because membership in the group suggests that they have been able to view the information shared.

DISCLAIMER

This syllabus is an outline of the course and its policies, which may be changed for reasonable purposes during the semester at the instructor's discretion. You will be notified in class and / or via email if any changes are made to this syllabus, and an updated syllabus will be provided on Canvas.

Thinking Like Machines
Fall 2022 – Schedule

Week		Date	Description	Assignment Due
1	Mon	Aug 22	Introductions & Overview	
	Wed	Aug 24	Digital Literacy, Part I	
2	Mon	Aug 29	Digital Literacy, Part II	
	Wed	Aug 31	Digital Empowerment	Getting to Know You
3	Mon	Sep 05	No Class - Labor Day	
	Wed	Sep 07	Decomposition & Pattern Recognition	Using Online Knowledge
4	Mon	Sep 12	Abstraction	
	Wed	Sep 14	Algorithms	Decomposing Problems
5	Mon	Sep 19	Boundary Conditions & The Unexpected	
	Wed	Sep 21	Flowcharts & Pseudocode	Writing Algorithms
6	Mon	Sep 26	Exam 1 Review	
	Wed	Sep 28	**Exam 1**	
7	Mon	Oct 03	Programming Languages	
	Wed	Oct 05	Variables and Operators	Install Python
8	Mon	Oct 10	Python's Built-In Functions	
	Wed	Oct 12	Strings and Lists	Python Project 1: Variables
9	Mon	Oct 17	Conditional Statements: If Statements, Part I	
	Wed	Oct 19	Conditional Statements: If Statements, Part II	
10	Mon	Oct 24	Conditional Statements: While Loops	
	Wed	Oct 26	Conditional Statements: For Loops, Part I	Python Project 2: Lists & Ifs
11	Mon	Oct 31	Conditional Statements: For Loops, Part II	
	Wed	Nov 02	Errors, Debugging, and More Decomposition	
12	Mon	Nov 07	Input and Output, Part I	
	Wed	Nov 09	Input and Output, Part II	Python Project 3: Loops
13	Mon	Nov 14	Functions, Part I	
	Wed	Nov 16	Functions, Part II	
14	Mon	Nov 21	No Classes - Thanksgiving Break	
	Wed	Nov 23		
15	Mon	Nov 28	Exam 2 Review	
	Wed	**Nov 30**	**Exam 2**	Python Project 4: File I/O
16	Mon	Dec 05	Python Libraries	
	Wed	Dec 07	Final Project Help Session (Online)	Final Project Task 1
17	Mon	Dec 12		
	Wed	Dec 14		Final Project / Final Project Task 2