

University of Florida
College of Public Health & Health Professions Syllabus
PHC 3793: Higher Thinking for Healthy Humans: AI in Healthcare and Public Health
(3 Credit Hours)
Fall 2025

Delivery Format: On-Campus (In-person) Tuesdays 1:55 – 3:50 PM & Blended Learning
<http://elearning.ufl.edu/>

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Zoom Address: <https://ufl.zoom.us/j/91771352581>
Teaching Assistants: Karen Liang (liang.kz@ufl.edu)
Preferred Course Communications: Messages via Canvas

Prerequisites

STA2023 or equivalent; or permission from instructor

PURPOSE AND OUTCOME

Course Overview

This course covers a broad overview and introductory level of history, foundational concepts, and basic methods on artificial intelligence (AI), focusing on public health and healthcare applications, including hands-on practice on graphical/high-level AI software. The course neither provides or necessitates prior programming knowledge nor advanced statistical/machine learning training.

Relation to Program Outcomes

This course contextualizes historical and methodological topics of AI into public health, healthcare, and relevant research applications. The course enriches our educational program covering 'next-generation data science', in compliance with up-to-date accreditation standards, and with translational relevance to public health, healthcare, and professional practice.

AI Credit. Know and Understand AI (Know-AI): Know the basic functions of AI and to use AI applications in the context of public health and healthcare. AI course content is over 50%.

Student Learning Outcomes Related to AI Categories (AI-SLOs). 1) Identify, describe, and/or explain the various characteristics of AI, such as differentiation of supervised, unsupervised, and reinforcement learning. 2) Recognize, identify, describe, define, and explain applications of AI in the domain of public health and healthcare, such as in medical research and healthcare administration.

Course Objectives and/or Goals

1.0 *This course has the objective to provide the students with conceptual understanding of fundamental AI methods, including practical examples in public health and healthcare, and to get them acquainted with high-level AI software for data analysis and visualization. Upon successful completion of the course, students will be able to:*

- 2.0 Explain the history of AI and conceptual theory of basic machine learning algorithms;
- 3.0 Give examples of basic AI methodologies and discuss where they are best utilized in Public Health and Healthcare;
- 4.0 Evaluate the performance of AI models and validate their appropriateness;
- 5.0 Describe the health implications/issues related to AI modelling and presence of bias, addressing the concepts of causal AI;
- 6.0 Summarize typical use cases and applications of AI in Public Health and healthcare;
- 7.0 Utilize high-level graphical AI software to execute a machine learning pipeline on provided dataset without the need of prior programming knowledge.

Knowledge-based goals according to Bloom's taxonomy of educational objectives:

- *Knowledge*. Recognition of machine learning / AI techniques, e.g. "What is an artificial neural network?"
- *Comprehension*. Ability to understand the intended use of AI methods, e.g. "Can an artificial neural network be used to predict whether a tumor is benign or malignant?"
- *Application*. Ability to use AI methods in a specific context, e.g. "Can we apply an AI method to identify a possible causal structure from the given data?"
- *Analysis*. Ability to draw conclusions using data and AI models, e.g. "Can we visualize the socio-demographic clusters found by the AI algorithm on the data, and evaluate if they are associated to different health outcomes?"
- *Evaluation*. Ability to use the AI modelling for translational purposes, e.g. "After simulating several public health intervention scenarios with the deep learning model, we conclude that the best strategy according to the resource constraints is..."
- *Synthesis*. Ability to decide if the AI pipeline is adequate for a problem of interest, e.g. "For this prediction problem, we conclude that a linear regression is a better choice than a deep learner because it has similar performance, but it is more interpretable."

Instructional Methods

The course will be divided into in-person class sessions (once per week) and supplemented with online lectures and content through a blended learning approach. The online content delivery will be through the course's Canvas site. Course materials and assignment may include homework and critical reading of scientific papers. Teaching materials/links will be posted online. All course slides will be made available online for download. The online material (including this syllabus) will be processed through SensusAccess to make sure it is compliant to Federal, State and University's accessibility policies and governance.

Blended Learning

What is blended learning and why is it important?

A Blended Learning class uses a mixture of technology and face-to-face instruction to help you maximize your learning. Knowledge content that, as the instructor, I would have traditionally presented during a live class lecture is instead provided online before the live class takes place. This lets me focus my face-to-face teaching on course activities designed to help you strengthen higher order thinking skills such as critical thinking, problem solving, and collaboration. Competency in these skills is critical for today's health professionals.

What is expected of you?

You are expected to actively engage in the course throughout the semester. You must come to class prepared by completing all out-of-class assignments. This preparation gives you the knowledge or practice needed to engage in higher levels of learning during the live class sessions. If you are not prepared for the face-to-face sessions, you may struggle to keep pace with the activities occurring in the live sessions, and it is unlikely that you will reach the higher learning goals of the course. Similarly, you are expected to actively participate in the live class. Your participation fosters a rich course experience for you and your peers that facilitates overall mastery of the course objectives.

DESCRIPTION OF COURSE CONTENT

Topical Outline/Course Schedule

The first half of the semester is dedicated to AI theory and fundamental concepts; the remaining half will cover practical applications of AI in public health and healthcare with guest lectures from experts in the field.

Class schedule:

Week	Date	AI-Related Topic	# Hours of AI-related Content	AI-Related Assignment (on weekly topic)
1	Aug-26	Introduction, AI history, and healthcare data	3	HW 1 out
2	Sept-2	Machine learning introduction; Project discussion	3	HW1 due (9/1); HW2 out; Install Weka; Group formation due in-class (9/5)
3	Sept-9	SVM; k-Nearest Neighbor; Exam Prep	3	HW2 due (9/8); HW3 out; kNN Weka
4	Sept-16	EXAM 1	3	HW3 due (9/15)
5	Sept-23	Tree-based methods; Project discussion	3	HW4 out; DT Weka; Project pitch due in-class (9/26)
6	Sept-30	Clustering; Neural networks; Exam Prep	3	HW4 due (9/29); HW 5 out; Clustering Weka; Project proposal due (9/29)
7	Oct-7	EXAM 2	3	HW5 due (10/6)
8	Oct-14	AI applications in Medical Imaging (Dr. Stolte); Project Discussion	3	Finalize project in-class (10/17)
9	Oct-21	Project Presentation 1	3	
10	Oct-28	Project Presentation 2	3	Project Report due (10/31)
11	Nov-4	AI for Rehabilitation and Assistive Technology (Dr. Wang)	3	
12	Nov-11	Veterans Day – No Class		Research Paper Part 1 due (11/14)
13	Nov-18	AI applications in Cognitive health and ADRD (Dr. Gullett)	3	
14	Nov-25	Thanksgiving Break - No Class		
15	Dec-2	Application of AI/LLM in Behavioral Research (Dr. Wu)	3	
16	Finals week	No Class		Research Paper Part 2 due (12/8)

Course Materials and Technology

- **Course slides.** Provided by the course instructor and posted online.
- **Textbook(s).** None mandatory. Recommended (optional) freely available online textbooks/resources: “Introduction to Statistical Learning” (<https://www.statlearning.com/>) and “Deep Learning” (<https://www.deeplearningbook.org/>).
- **Reading materials.** Provided by the course instructor and posted online.
- **Hardware.** Webcam and Microphone may be required for out-of-class activities. Additional technical requirements are outlined at <https://it.php.ufl.edu/php-computer-requirements/>
- **e-Learning in Canvas site.** There will be an online site for this course in Canvas, the learning management system supported by the University. Log in at <https://elearning.ufl.edu/> and go to course site for PHC3793: Fall

2025. The syllabus, out-of-class course content, assignments, and other course materials will be posted here. The course site will also allow for discussions/chats among the students and course leaders. You will also turn in assignments through this site. It will be your responsibility to check the site on a routine basis to keep up with announcements, emails, and content modifications.

- **Software.** Weka (<https://www.cs.waikato.ac.nz/ml/weka/>).
- **For technical support for this class,** please contact the UF Help Desk at:
 - Learning-support@ufl.edu
 - (352) 392-HELP - select option 2
 - <https://lss.at.ufl.edu/help.shtml>

ACADEMIC REQUIREMENTS AND GRADING

Assignments

Weekly Homework (25 points, 5 X 5 points each, 25% of Total Grade)

During Weeks 1 through 6, a case or problem set will be assigned (5 total assignments at 5% each, equal to 25% of total grade). Assignments will include but are not limited to multiple choice, matching, short answers, and interpreting results. The topics of the assignments will reflect the lecture topics covered in that same week (e.g., Homework 1 will cover AI history and healthcare data). Homework write-ups and related files will be turned in electronically via the Canvas e-learning system.

Group Project Assignment (20 points, 20% percent of Total Grade)

This is a **group assignment** made up of 3-4 students per group. Each group will develop an imaginary public health or healthcare project where machine learning/AI could be applied, integrating the topics covered in class. The project must include the following components: problem statement, background research, methods plan, critique of generative AI, and mock results and discussion (including interpretation, ethical considerations, and potential pitfalls or limitations). This assignment accounts for 20% of the total grade. All group members will receive the same score; therefore, **everyone should contribute equally to the project, as evidenced by a contribution statement at the end of the written report.**

1. Written list of group project members (2% of total grade)
2. Project Pitch Presentation (2% of total grade)
3. Written Project proposal (5% of total grade)
4. Project Presentation (5% of total grade)
5. Written Project Report (6% of total grade)

Research Paper (15 points, 15% percent of Total Grade)

This is an **individual assignment**. Submit two research papers based on Week 8 & 11 (Part 1) and Week 11 & 13 (Part 2) guest lectures in the class. Student will provide the following:

1. Lecture Summary: Concisely summarize the key points and main themes covered in the guest lecture.
2. Concept Connections: Relate specific concepts discussed in the guest lecture to those learned in the preceding weeks (taught in class Week 1-6).
3. Term Research: Investigate at least one unfamiliar terminology introduced during the guest lecture and provide explanations.
4. Insight and Reflection: Share personal insights and reflections on how the guest lecture enhances the overall learning experience.
5. Conclusion: Sum up reported research findings and present the main takeaways from these lectures.

Exam 1 (15 points, 15% of Total Grade)

Students will take a 15-question in-class exam. The exam will take place during the normally scheduled class time. You will need to bring a laptop or other device to access the exam via Canvas, no sharing permitted. Questions will address all content included in Weeks 1 through 3. The exam will require the lockdown browser provided via Canvas.

Exam 2 (15 points, 15% of Total Grade)

Students will take a 15-question in-class exam. The exam will take place during the normally scheduled class time. You will need to bring a laptop or other device to access the exam via Canvas, no sharing permitted. Questions will address all content included in Weeks 5 and 6. The exam will require the lockdown browser provided via Canvas.

In-class Participation (10 points, 10% of Total Grade)

In addition to live lectures, we will be incorporating in-class active learning approaches by using interactive and discussion-based activities. Students are expected to be engaged during class and participate in pair or small group class discussions/activities. Example activities will include problem solving/analysis, peer-peer interaction, paper reading/synthesis, small group activities, case studies, and similar. In the event that students are not able to attend live classes, they should contact instructors for make-up participation.

Extra Credit (no more than 5%)

Extra Credit opportunities will be available throughout the semester at the discretion of the instructor.

Grading

Requirement	Due date	Points or % of total grade (% must sum to 100%)
Weekly Homework	Mondays at 11:59PM	25 Points (5 x 5-points each) 25% of Total Grade
Exam 1	September 16, in-class	15 Points, 15% of Total Grade
Exam 2	October 7, in-class	15 Points, 15% of Total Grade
Group Project Assignment	Formation: September 2, in-class Pitch: September 23, in-class PPT #1: September 29, 11:59PM PPT #2: October 21 or 28, in-class Report: October 31, 11:59PM	20 Points, 20% of Total Grade
Research Paper	Part 1: November 14, 11:59PM Part 2: December 8, 11:59PM	15 Points, 15% of Total Grade
Class Participation	Synchronous (live lectures)	10 Points, 10% of Total Grade

Point system used:

Percentage Earned	Letter Grade
93-100	A
90-92.9	A-
87-89.9	B+
83-86.9	B
80-82.9	B-
77-79.9	C+
70-76.9	C
67-69.9	D+
63-66.9	D
60-62.9	D-
Below 60	E

Letter Grade	Grade Points
A	4.0
A-	3.67
B+	3.33
B	3.0
B-	2.67
C+	2.33
C	2.0
C-	1.67
D+	1.33
D	1.0
D-	0.67
E	0.0
WF	0.0
I	0.0
NG	0.0
S-U	0.0

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Exam Policy

The exam will take place during the normally scheduled class time. You will need to bring a laptop or other device to access the exam via Canvas; let me know in advance if this will be an issue. The exam will require the lockdown browser (LDB), which is its own browser. If you don't have one installed yet, LDB download will be prompted on Canvas. Students are required to test LDB on their laptop (remember to close all browsers, background tabs, and apps active on your device) prior to coming to class for the exam.

Policy Related to Make Up Exams or Other Work

Make-up work will be determined on a case-by-case basis. Please send an email to the instructor.

Please note: Any requests for make-ups due to technical issues should be accompanied by the UF Computing help desk (<http://helpdesk.ufl.edu/>) correspondence. You MUST e-mail the instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Late Assignments. Each late assignment will receive a penalty of 25% deduction per day from the total correct score. Special Circumstances. In the event of exceptional situations that may interfere with your ability to perform an assignment or meet a deadline, contact the instructor as soon in advance of the deadline as possible. Such cases will be dealt with on an individual, case-by-case basis.

Absences should be discussed with the instructor in advance when possible. Late arrivals to class start-time and early departures before class ends are discouraged, as they have the potential to disrupt the class. However, extenuating circumstances occur and sometimes these things are necessary. If necessary, please make such instances as minimally disruptive as possible out of courtesy to the rest of the class.

Please note: Any requests for make-ups due to technical issues should be accompanied by the ticket number received from UF Computing Help Desk (helpdesk@ufl.edu) when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail the instructor, as applicable, within 24 hours of the technical difficulty if you wish to request a make-up.

Course Policy Related to Required Class Attendance

All instructors are bound by the UF policy for excused absences. For information regarding the UF Attendance Policy see the Registrar website for additional details: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>. Attendance at all scheduled course activities is expected. Additionally, students will be responsible for additional out-of-class activities as part of a partially blended classroom environment (described above). Further, the assignments outlined will be completed outside of class. Students will be required to meet with their term project groups outside of class and may find it beneficial to attend other events or have additional scheduled meetings, depending on the topic selected by their working group outside of the in-person course meetings. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/>

Policy Related to Guests Attending Class. Only registered students are permitted to attend class. However, we recognize that students who are caretakers may face occasional unexpected challenges creating attendance barriers. Therefore, by exception, a department chair or his or her designee (e.g., instructors) may grant a student permission to bring a guest(s) for a total of two class sessions per semester. This is two sessions total across all courses. No further extensions will be granted. Please note that guests are not permitted to attend either cadaver or wet labs. Students are responsible for course material regardless of attendance. For additional information, please review the Classroom Guests of Students policy in its entirety. Please consult UF guideline: <https://catalog.ufl.edu/UGRD/academic-regulations/>

Policy Related to AI Use in This Course

When authorized by the course director, students may use AI technologies in the completion of coursework as long as they cite all such use by naming the technology and how it was employed. Students assume full responsibility for all content, including errors and omissions. Assistive technology authorized as part of an accommodation for a disability is always permitted.

Course instructors may adjust limitations on AI assistive technology use and must communicate any limitations to students sufficiently in advance of the assignment due date. Failure to cite the use of AI assistive technology, or use of the technology disregarding specific course limitations is considered academic misconduct. **The use of AI on assignments, essays/reflection papers, exams, and quizzes when prohibited by course or college instructions is**

considered cheating and students are violating the UF Regulations 4.040 [Student Honor Code](#) and [Student Conduct Code](#).

It is important to note that many generative AI models (e.g. ChatGPT, ChatSonic, Google Bard etc) place any information that they are provided with into the public domain. When using such tools, you must therefore ensure that they are **never provided with confidential information**. UF AI systems (e.g., Co-Pilot, NaviGator) should never be provided with confidential information. For the avoidance of doubt, the use of such tools is prohibited for generating any confidential communications, including, but not limited to, communications relating to patient records, clients, students and intellectual property. You are also reminded that you should always review the terms and conditions of any third-party software you use (e.g. proofreading tools) to ensure that any data they are provided with is appropriately protected. Always verify information and sources generated by AI tools. AI has been known to generate false information and to cite non-existent sources. Also, because AI-generated text mines people’s intellectual property without appropriate credit, this raises ethical concerns.

It is not acceptable to use generative AI for reflective writing, as by its very nature, the process of reflective writing demands that you actively engage in the writing process. Delegating this to a natural language processing algorithm may produce convincing outputs but does not demonstrate development in your professional practice. Students are responsible for understanding their dynamic data stewardship responsibilities to minimize personal, college, and university risk.

[UF Integrated Risk Management – CHATGPT Privacy, Factual Accuracy and Usage Guidelines](#)

ACADEMIC POLICIES & RESOURCES

University academic policies and resources can be found at: <https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/>

STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

Expectations Regarding Course Behavior

Students are expected to be respectful, professional, and contribute to a positive learning environment. Participation through listening, speaking, and engaging with others is essential. Cell phones must be silenced and used only outside of class. Laptops and tablets may be used only for class work. Speak respectfully, listen to others, and do not interrupt during discussions.

Recording Within the Course. Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without the permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not

limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Communications Guidelines

The communication guidelines are a collaborative agreement between all students and the instructor (and TA, as applicable). Email messages are expected to be sent through UF email or the Canvas system. Students should expect a response within 2 business days (48 hours).

Announcements. Class announcements will be sent via the announcements tool in eLearning. Depending on your CANVAS notification settings, you may or may not be notified via email; you are responsible for all information in these announcements whether or not you see them in your email.

Further, please see the university's Netiquette Guidelines:

<https://teach.ufl.edu/wp-content/uploads/2020/04/NetiquetteGuideforOnlineCourses.docx>

Online Faculty Course Evaluation Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways:

1. The email they receive from GatorEvals,
2. Their Canvas course menu under GatorEvals,
3. The central portal at <https://my-ufl.bluera.com>

Guidance on how to provide constructive feedback is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

If 80% of students submit the online faculty evaluation, 1 additional point will be applied to the final grade of all students. If 100% of students submit the online faculty evaluation, 2 additional points will be applied to all student's final grade.

PHHP Student Resources

PHHP's UPTurn (Unified Pathways to Support Wellness) program is a *no-cost mental health and wellness program* that is offered year-round to all PHHP students (undergraduate, graduate and professional level) and students (from any college) who are enrolled in PHHP courses. UPTurn advisors support students on their wellness journeys by curating individualized plans (resources and support) to help them manage academic, social, emotional, and health-related stress.

Interested students are paired with an UPTurn advisor, who meets with each student *virtually* (Zoom, Teams, phone) or *in person* (private office/room in HPNP) for a 45-minute consultation, followed by (if desired):

1. Up to 4 follow-up skills-building visits
2. When needed and appropriate, up to 10 psychotherapy sessions after completion of the 4 follow-up skills-building visits

Note: UPTurn is NOT a crisis/emergency resource. Students who are in crisis are strongly encouraged to use UF's existing crisis support resources, which are listed here: <https://counseling.ufl.edu/services/crisis/>

Students can learn more about UPTurn and request an appointment here: <https://phhp.ufl.edu/student-resources/upturn-wellness-program/>

Any questions regarding UPTurn can be directed to upturn@phhp.ufl.edu or (352) 273-6850.

Inclusive Learning Environment

Public health and health professions are based on the belief in human dignity and on respect for the individual. As we share our personal beliefs inside or outside of the classroom, it is always with the understanding that we value and respect diversity of background, experience, and opinion, where every individual feels valued. We believe in, and promote, openness and tolerance of differences in ethnicity and culture, and we respect differing personal, spiritual, religious and political values. We further believe that celebrating such diversity enriches the quality of the educational experiences we provide to our students and enhances our own personal and professional relationships. We embrace The University of Florida's Non-Discrimination Policy, which reads, "The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act."
