WENTWORTH INSTITUTE OF TECHNOLOGY

College of Engineering and Technology

IMPACT OF AI ON SOCIETY
Spring 2022

Course Number: COMP3800 - 09

Class Schedule: Lecture and lab: 5:00 pm – 8:50 pm Tuesday

Instructor Name: Armen Pischdotchian

Class Location: Zoom

Telephone Number: (617) 699 6532 (text only)

Appointments and Meetings: Office Hours by Appointment. Let's use Slack (#comp3800Spring2022)

Email address: pischdotchiana@wit.edu

Credits/Hours: 4 (Lecture/Lab/Total credits)

COURSE DESCRIPTION

This course is designed to introduce students to the concepts and methodologies of artificial intelligence (AI) and data science. As these two fields begin to merge machine learning (a subset of AI) is needed to extract insights from both structured (csv, Excel) and unstructured (images, text, etc.) data. These approaches beckon artificial neural networks that predict and classify using estimators known as Deep Learning. Therein, the practitioners wrangle with terms such as confusion matrix, accuracy, recall and precision. Different implementation approaches are presented along with their societal concerns such as drift in fairness that may surface due to biased data or algorithms.

COURSE PREREQUISITES

- Undergraduate level COMP 1000 Minimum Grade of TR or Undergraduate level ELEC 3150 Minimum Grade of TR and Undergraduate level MATH 1030 Minimum Grade of TR or Undergraduate level MATH 2100 Minimum Grade of TR. All pre-reqs are strongly encouraged but not required.

REQUIRED TEXTBOOK

Prediction Machines

COURSE LEARNING OUTCOMES

At the completion of this course, students should be able to:

- Explain how AI systems understand vision and language
- Build a virtual agent using Natural Language Processing techniques

- Gain an awareness of the ethics and bias of AI implementation
- Explore what it takes to be a data scientist
- Perform data analytics and build machine learning models
- Obtain a Design Thinking badge.
- Obtain a Data Science badge from Cognitiveclass.ai

INSTRUCTIONAL METHODOLOGIES

This course will combine traditional lecturing with hands-on assignments that reinforce the lecture material. Lectures will focus on concepts and ideas while the assignments will provide concrete experience and skills. In many instances, examples and demonstrations will be given during lectures and laboratory sessions. Discussions will be a major component of this course. As such, your preparation for and participation in the discussions is vital to your success in the course.

ATTENDANCE POLICY

Students are expected to attend classes regularly, take sufficient notes, complete readings, assignments, exams, and other work at the times specified by the instructor. Students who are absent repeatedly from class or laboratory will be evaluated by the faculty responsible for the course to ascertain their ability to achieve the course objectives and to determine if they will be allowed to continue in the course. Instructors may include, as part of the semester's grades, marks for the quality and quantity of the student's participation in class. At the discretion of the instructor, a student who misses more than three class meetings may be withdrawn from the course by the instructor. A grade of WA will appear on the student's official transcript as a result.

GRADING POLICY

There will be multiple lab and presentation assignments during the semester. Assignments will involve number Each assignment will include a detailed description of the problems and expectations for successful completion.

There is no final exam for this course. Rather, students will complete a final project that will consist of implementing AI or data science solution of their choice. The project assignment will include a detailed description of the project expectations for successful completion. The requirement will be announced in the class.

Student grades are based upon the following criteria:

Live presentations/demo individual	20%
Midterm exam: open-book, 50 multiple choice questions, two-hour limit	25%
Your LinkedIn account has the following attributes: • Data Science Practitioner badge • Design Thinking Practitioner badge • Link to your Medium.com publication	30%
Final Project: Make it personal; use your or own dataset, structured or unstructured; have it feature one or more of the APIs that you enjoyed working with most; pay huge attention to presentation both slides and the video	20%
Participation	5%

WENTWORTH GRADING SYSTEM:

Grade	Weight	Numerical Definition	Definition
A A-	4 3.67	93-100 90-92	Student learning and accomplishment far exceeds published objectives for the course/test/assignment and student work is distinguished consistently by its high level of competency and/or innovation.
B+ B B-	3.33 3 2.67	87-89 83-86 80-82	Student learning and accomplishment goes beyond what is expected in the published objectives for the course/test/assignment and student work is frequently characterized by its special depth of understanding, development, and/or innovative experimentation.
C+ C C-	2.33 2 1.67	77-79 73-76 70-72	Student learning and accomplishment meets all published objectives for the course/test/assignment and student work demonstrates the expected level of understanding and application of concepts introduced.
D+ D	1.33 1	67-69 60-66	Student learning and accomplishment based on the published objectives for the course/test/assignment were met with minimum passing achievement.
F	0	0-59	Student learning and accomplishment based on the published objectives for the course/test/assignment were not sufficiently addressed or met.

DROP/ADD

Students should check the academic calendar to confirm the add/drop deadline. Dropping and/or adding courses is done online. Courses dropped in this period are removed from the student's record.

Non-attendance does not constitute dropping a course. If a student has registered for a course and subsequently withdraws or receives a failing grade in its prerequisite, **then the student must drop that course**. In some cases, the student will be dropped from that course by the Registrar. However, it is the student's responsibility to make sure that he or she meets the course prerequisites and to drop a course if the student has not successfully completed the prerequisite. The student must see his or her academic advisor or academic department chair for schedule revision and to discuss the impact of the failed or withdrawn course on the student's degree status.

MAKE-UP POLICY

Due to the nature of this project-based course, all submissions and presentations must be completed on time. Any late deliverables will be assigned a grade of zero.

ACADEMIC SUPPORT

The Center for Academic Excellence facilitates Wentworth students' academic success and helps them to achieve their full learning potential. Students may choose to receive individual assistance through one-on-one tutoring in many subjects, including math, science, writing, and major classes. In addition, the Center for Academic Excellence offers Facilitated Study Groups (FSGs), tutor-led study tables, academic workshops, and learning-strategy consultations. The peer-tutoring program is certified by the College Reading and Learning Association's International Tutor Training Certification program.

To make an appointment or to review their drop-in offerings, please visit http://www.wit.edu/cae.
For additional assistance or support on subjects not listed, please reach out via email at cae@wit.edu.

ACADEMIC HONESTY STATEMENT:

Students at Wentworth are expected to be honest and forthright in their academic endeavors. Academic dishonesty includes but is not limited to cheating, prohibited collaboration, coercion, inventing false information or citations, plagiarism, tampering with computers, destroying other people's coursework or lab or studio property, theft of course materials, posting coursework/course materials to websites, or other academic misconduct. If you have any questions, contact your professor prior to submitting an assignment for evaluation. See your academic catalogue for a full list of definitions and the WIT Academic Honesty website for the procedures: wit.edu/academic-honesty.

STUDENT ACCOUNTABILITY STATEMENT:

Behavior unbecoming a student is any violation of a published Wentworth policy in an academic environment, and/or any behavior that individual faculty or staff determines is unacceptable in his or her classroom, laboratory, or other academic area or function. Behavior unbecoming a student in an academic environment will not be tolerated. Violations of behavioral expectations may be forwarded to the Office of Community Standards for disciplinary action.

Wentworth takes violations of academic dishonesty and misconduct very seriously. Sanctions for such violations include, but are not limited to, a grade of "F", removal from a course, Institute suspension, or Institute expulsion.

WELLNESS AND DISABILITY SERVICES:

College can be challenging and it is common to feel overwhelmed or stressed at times. If these feelings are related to course work or academic performance, please talk to me. For more significant mental health concerns, the **Center for Wellness and Disability Services (003 Watson Hall, 617-989-4390)** provides free and confidential mental health counseling.

If you or someone you know needs support around thoughts of suicide, the following resources are available:

- Center for Wellness and Disability Services, Watson 003, 617-989-4390, M-F 8:15-4:45
- Campus Police, First level of 610 Huntington Avenue, 617-989-4444, 24/7
- Samaritans, call or text 1-877-870-4673
- Crisis Text Line, text "start" to 741-741
- National Suicide Prevention Lifeline, call 1-800-273-8255
- GLBT Youth Hotline, call 1-866-488-7386
- Beth Israel Deaconess Emergency Room, 190 Pilgrim Rd Boston, MA

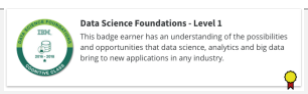
Students requiring academic accommodations must provide an official accommodation memo from the **Center for Wellness and Disability Services** and contact me privately to discuss logistics.

COLLEGE OF THE FENWAY STUDENTS:

If you are enrolled in this course through COF Cross Registration, notify your course instructor. Please provide her/him with your email address to be sure that you receive course information in a timely way. You should also discuss how to access online applications that might be used in the course.

WEEKLY SCHEDULE

A tentative schedule is provided below. The schedule is subject to change as the semester progresses.

Week	Lecture (record)	Lab (we do it together)	Assignment (Preferably completed while in session)
Jan 11	Self-Introductions About the Agenda Intro to AI lecture (1-21)	• Obtain IBM Cloud	Register/create the following accounts: LinkedIn Medium Github, and Read Prediction Machines Chapters 1 and 2
Jan 18	Recap of Chap 1 and 2 The three machine learning approaches	Lab: Tone Analyzer and Natural Language Understanding	Update the spreadsheet with your Github, Medium, and LinkedIn links Read Chapters 3,4,5
Jan 25	Recap of Chap 3,4,5 Machine Learning Explained	Lab: Build a chatbot	Read Chapter 6
Feb 1	Recap of Chap 6	Lab: Node-RED: how to code without coding	Read Chapter 7
Feb 8	Recap of Chap 7	Presentations 5 minutes each.	Read Chapter 8
Feb 15	Recap of Chap 8 Midterm exam	The exam contains 50 multiple choice questions two hours long. It is open book, we do it in class and we get to collaborate together.	Read chapter 9
Feb 22	Recap of Chap 9 About Data Science (DS) Demo Watson Studio	Provision Watson Studio Lab: Working with AutoAI	Read Chapters 10 and 11
Mar 1	Recap of Chap 10 & 11 Data Science labs	Lab: Working in Jupyter Notebooks, Python	Read Chapters 12, 13 and 14
Mar 8	Recap of Chap 12, 13 and 14 Data Science labs	Lab: Fairness, Drift and Quality of your models	Read chapters 15, 16
Mar 15	Recap of Chap 15 & 16 Data Science labs	Write 1-page summary and post to Medium	Read Chapter 17, 18 and 19
Mar 29	Data Science 101 badge	Complete the course in class	
April 5	Design Thinking badge	Complete the course in class	You must obtain both badges, either while in class or afterwards before Dec 8
April 12	Final group presentation	Done in class	
April 19	Final group presentations	Done in class	