COMP 574 Applied Computing II: FOUNDATIONS OF MACHINE LEARNING

Credits: 4
Term: Fall 2021
Class Meetings: Thursday 1 - 3:50 PM
Location: P128
                       Hybrid Delivery - SCHEDULED MEETING TIME, ONLINE WITH SOME CAMPUS VISITS
Instructor: Karen Jin
Department: Applied Engineering and Sciences Department, UNH Manchester
Office: P139
Email & Phone: karen.jin@unh.edu, (603) 641-4398
Office hours: https://calendly.com/karenajin You may also email to arrange a time to meet other
                       than the time slots listed.

COURSE INFORMATION

CATALOG DESCRIPTION

Introduction to making informed, data-based decisions with machine learning, data representation and
analysis tools, and programming. Emphasis is on the importance of gathering, cleaning, normalizing, visualizing
and analyzing data to drive informed decision-making in any field of study. Students learn to use tools and
techniques to work on real-world datasets using procedural and basic machine learning algorithms. Students
also learn to ask good, exploratory questions and develop metrics to come up with a well-thought-out analysis.
Prereq: COMP 424.

RESOURCES

All course materials will be posted on this site. Textbooks are not required. The course semester has 14 weeks
with weekly 2 hour and 50 minute class meetings. These class meetings are structured to create a problem-
based learning environment. You will work in teams or individually and explore, question, and explain how key
ideas in data analysis. You are expected to at least study 4-6 hours outside class every week.

The Computing Program in the Department of Applied Engineering and Sciences has **student tech consultants**
who are available to help with software configuration and other technical questions you might have. You'll find
them in the Tech Consultancy Workroom 124. Working hours are displayed on the door. Course-related
communication will take place on our Discord Server.

GRADING SCHEME

Your final grade is calculated as follows:

Labs (25%)
The weekly labs consist of hands-on lab exercises and other active learning activities. Students will be active
participants in the development of the content material through individual and group activities and Internet
research. Labs are designed to be started and completed during the class meeting time. If you are unable to
complete the lab during class then you need to complete on your own before the due day. All labs are due at
11:59pm on the day of class. Submissions will not be accepted after the deadline. Submissions must be
completed through MyCourses in order to receive credits.

Homework (25%)
Independent homework assignments are given and collected on a weekly basis. Unless specifically stated, the
major portion of the course work is in the format of a Jupyter Notebook and distributed through our Github
classroom. The homework is designed to build your understanding of the class topics and to develop your

problem solving ability. Topics from the homework will be used in class activities, exams and the final project so it is important to complete the material with accuracy and understanding. Each assignment is due at the date and time listed. It is your responsibility to allow enough time during the week to complete the activities despite obstacles (technology driven or personal) that may arise. Late work is anything submitted after the announced due date and time. You will lose 10% per day for work submitted late for up to 48 hours after the due day. Submissions must be completed through MyCourses in order to receive credits.

Final Project (20%)
You will complete one individual project and one optional small team project. Both projects allow you to explore in-depth real datasets that are provided, or your own dataset created from an online survey that has a sufficient number of participants. The submission of the individual project will be in Jupyter Notebook, which includes documentation that includes data exploration, data cleaning, and an explanation of the data analysis results. The team project allows you to experience the pipeline of creating a data analytic solution. Each student will give a presentation in class.

Participation (10%)
The participation is calculated based on 1) both the quantity and quality of the posts in the Discord discussion forum., and 2) individual check-in meetings with the instructor. To earn full points, you must fulfill the discussion requirements for the discussion topic assigned, and complete of at least one individual check-in meeting.

Final Exam (20%)
There will be a final exam in the format of written and/or oral assessment. Details TBA.

(Note: Please contact me regarding any discrepancies about any grades you have received within 3 days after the grade is published.)

TENTATIVE COURSE SCHEDULE

This is a tentative schedule, subject to change depending on the class pace, student learning needs, and/or unforeseen circumstances. Check the course announcements and emails in MyCourses for up-to-date information.

Week 1 (September 2): Resources and tools; Jupyter notebooks; Python Review
Week 2 (September 9): Intro Pandas and working with data
Week 3 (September 16): Intro to NumPy
Week 4 (September 23): World Happiness Rankings & IMDb Movie Data
Week 5 (September 30): A Simple Movie Recommender
Week 6 (October 7): Merge and Grouping datasets
Week 7 (October 14): Data Visualization & GCP Big Query
Week 8 (October 21): Web Scraping
Week 9 (October 28): JSON APIs
Week 10 (November 4): Individual Check-in (Project Milestone I due)
Week 11 (November 11): Veterans Day No Class
Week 12 (November 18): Introduction to predicative analysis
Week 13 (November 25): Thanksgiving No Class; Project Clinic on Tuesday November 23
Week 14 (December 2): More predicative analysis (Project Milestone 2 due)
Week 15 (December 9): Project Presentation (Project Final Milestone due)
Week 16 (December 16): Final Assessment

UNIVERSITY and MANCHESTER CAMPUS POLICIES

Academic honesty

1. **Graded work** in this class **should be entirely yours** and <u>shall not include work done by others or obtained from external sources.</u>
2. Collaboration on work is allowed only upon explicit instruction from the course instructor and only within the constraints given for that specific work. If unclear, you must consult with me on what is allowable. It is your responsibility to get such clarification.
3. Collaboration on all the work in this class is encouraged, unless explicitly stated that the assigned work must be individual work with no collaboration permitted.
4. Sharing the products of your work or your direct participation in doing work for others is also an instance of academic misconduct. Refrain from doing work on behalf of somebody else or from sharing your work products with other students.
5. If the **preparation of your artifacts** benefit from collaborations with peers, tutors, tech assistants, course instructor (that's me), or any other person (friend, relative, etc.), in cases in which collaboration is allowed, **submitted artifacts must include clear attribution to the kind of beneficial collaboration**.
6. If the **preparation of your artifacts** benefit from online sources (forums, public GitHub repos, tutorials, MOOCs, etc.), in cases in which collaboration is allowed, **submitted artifacts must include clear attribution to the source and source content** you have used.

Failing to comply with these rules is considered a violation of the academic honesty policy.

See the University Academic Policy at <u>https://www.unh.edu/student-life/09-academic-honesty</u>. for more information.

There are very serious repercussions if you deviate from the academic honesty policy:

1. The penalty for the first occurrence of an instance of academic dishonesty and plagiarism in this course is no credit for the graded work in question. Program Coordinator and Department Chair will be notified of your misconduct, and a letter from the Program Coordinator will be sent to you, course instructor, and faculty advisor.
2. The second instance of academic dishonesty in this course is penalized with failing the course. Program Coordinator, Department Chair, and Associate Dean of UNH Manchester or Graduate School (depending on your enrollment) will be notified. A letter from the Program Coordinator will be sent to you, course instructor, and faculty advisor. The Dean may decide on dismissal from the University.
3. If the first instance of academic dishonesty in this course is your second one, the course action described at #2 above will be followed.

Bottom line, do not plagiarize, do not share your work with others, and not collaborate, when allowed, without giving proper attribution.

Center for Academic Enrichment

The Center for Academic Enrichment (CAE) is a free resource for all students enrolled in UNH Manchester courses, as well as alumni with writing for graduate school applications and career seeking. Students are entitled to 1 hour of free individual tutoring, per course, per week. Make a tutoring appointment and access our services through the CAE myCourses Canvas site, call 603-641-4113 or email unhm.cae@unh.edu.

Accessibility services

According to the Americans with Disabilities Act (as amended, 2008), each student with a disability has the right to request services from UNH to accommodate his/her disability. If you are a student with a documented disability or believe you may have a disability that requires accommodations, please contact **Janessa Zurek**, **Student Accessibility Coordinato**r, in the Student Services Suite. Accommodation letters are created by our Coordinator with the student. Please follow-up with your me as soon as possible to ensure timely implementation of the identified accommodations in the letter. As a faculty member I have an obligation to respond once I receive official notice of accommodations, but I am under no obligation to provide retroactive accommodations. For more information refer to https://manchester.unh.edu/academics/academic-services/student-accessibility-services or contact the Student Accessibility Coordinator at 603.641.4383.

Needs of students of all faiths

In the event that you need accommodation for a religious or cultural holiday/observance, please let me know as early in the semester as possible.

Academic alerts to support your success

The University is invested in your academic success. If I will be concerned about your academic behavior or performance, I may choose to submit an academic alert. Academic alerts are not punitive. The goal is to provide you with support and resources to support your success. They act as an important check-in point and, if you receive an academic alert, a professional advisor will email your UNH email address with next steps. It is strongly recommended that you meet with a professional advisor and connect with me to discuss the reason for the alert.

Expectations of classroom behavior

To ensure a climate of learning for all, disruptive or inappropriate behavior may result in exclusion (removal) from class. As a reminder, use of cell phones/PDAs, and all other electronic devices, to include text messaging, is not permitted in class by Faculty Senate rule unless by instructor permission.

Emotional or mental health distress

UNH Manchester is dedicated to making sure you feel comfortable on campus, in Manchester, and at home. In partnership with The Mental Health Center of Greater Manchester, UNH Manchester offers consultation visits in the Academic Advising department (located in the Student Services suites, 4th floor). Services include:

- Free confidential screening & consultation with a licensed mental health therapist.
- Referrals to mental health or substance misuse treatment.
- And assistance in understanding how to afford additional treatment (with or without insurance!) or find free services.

You can access up to 10 free mental health sessions per academic year. Please call 603-641-4170 to schedule an appointment. Clinicians are available Tuesday and Thursday from 9am-5pm.

If you would like to connect to counseling services directly, you may do so by contacting The Greater Manchester Mental Health Center at (603) 668 - 4111. If you or someone you know is experiencing a mental health or substance misuse crisis, please contact the Mobile Crisis Response Team (MCRT) at (800) 688 - 3544.

The National Suicide Prevention Lifeline provides 24/7, free and confidential support via phone or chat for people in distress, resources for you or your loved ones, and best practices for professionals. Call (800) 273-TALK (8255).

Confidentiality and mandatory reporting

The University of New Hampshire and its faculty are committed to assuring a safe and productive educational environment for all students and for the university as a whole.   To this end, the university requires faculty members to report to the university's Title IX Coordinator (Donna Marie Sorrentino, dms@unh.edu , 603-862-2930/1527 TTY) any incidents of sexual violence and harassment shared by students.   If you wish to speak to a confidential support service provider who does not have this reporting responsibility because their discussions with clients are subject to legal privilege, you can find a list of resources (privileged confidential service providers/resources). For more information about what happens when you report, how the university considers your requests for confidentiality once a report is made to the Title IX Coordinator, your rights and report options at UNH (including anonymous report options) please visit (student reporting options).

Additional resources

Additional resources you might find helpful during the semester are:

- **Sexual Harassment and Rape Prevention Program (SHARPP**): Provides free and confidential advocacy and direct services to survivors. (https://www.unh.edu/sharpp.)
- **QPR** is a training program in mental health awareness and suicide prevention training offered by trained facilitators and members of the UNH Manchester community. Please contact Lisa Enright at lisa.enright@unh.edu should your department or program want to schedule a training session.

Behavior Intervention Team (BIT): Provides assistance to the UNH Manchester community when there is a need to activate a systematic, coordinated response to students who may be in crisis or whose mental, emotional or psychological health condition may substantially disrupt or directly threaten the safety of the learning environment. The BIT receives reports from security, students, faculty, administrators, and others regarding students of concern, develops and implements appropriate interventions, assists students in accessing appropriate resources and recommends appropriate actions to the Dean of Students when needed. More information can be provided by emailing the Chair of the UNH Manchester BIT at lisa.enright@unh.edu. Lisa will be able to help guide you in determining the proper referral procedure in any given case in consultation with BIT members. Please do not include the student's name in the email you send to her. Any BIT member can also be a helpful resource to you. BIT will work as close partners with faculty to provide a caring, holistic approach to promote student safety and well-being on the Manchester campus.