CS 6140: Machine Learning

Spring 2026

January 8, 2026

Instructor: Olga Vitek, o.vitek@northeastern.edu
Office hours Tue & Fri after the class, or by appointment.

Location: Tuesdays and Fridays 9:50am - 11:30am, Behrakis 310.

Teaching assistants:

Mr. Ishan Biswas, biswas.is@northeastern.edu.
Office hours Fridays from 3:00pm-4:00pm on zoom (see canvas), or by appointment

Mr. Chengyu Li, li.chengyu2@northeastern.edu.
Office hours Wednesday 10:00am-11:00am on zoom (see canvas) and Thursday 11:00am-12:00pm Snell library (room number announced every week)

Mr. Vivek Rangoju, rangoju.s@northeastern.edu.
Office hours Wednesday 10:00am-11:00am on zoom (see canvas) and Thursday 11:00am-12:00pm Snell library (room number announced every week)

Goals of the course: Machine learning is the study and design of algorithms, which enable computers/machines to learn from data. This course is an introduction to machine learning. It provides a broad view of models and algorithms, discusses their methodological foundations, as well as issues of practical implementation, use, and techniques for assessing the performance.

At the end of the course the students will (1) understand and implement common machine learning methods, (2) recognize the problems that are amenable to machine learning, and perform appropriate data analysis, and (3) recognize failure points and threats to validity of the results.

Pre-requisite: Official course prerequisites are CS 5800 or CS 7800 with a minimum grade of C. The mathematical literacy (multivariable calculus, probability, linear algebra) and computational literacy (programing languages such as R, Python or MATLAB) at the beginner graduate student level is required.

Course web page: https://ovitek.github.io/CS6140/S26/index.html
Daily updates on the schedule will be posted on the course page.

Attendance: Attendance is optional, but you are responsible for all the material and deliverables covered in class. There is no online attendance option and no recording for the class.

Communication: All handouts and discussion will be using Piazza
https://piazza.com/northeastern/spring2026/cs614003 You are encouraged to ask and answer questions on the discussion board. All important announcements will be made through Piazza. Please use public messages for all content-related posts, and private messages for personal matters. **Please do not email the instructor.** Course-related inquiries through personal email will be left unanswered.

Textbook: Required textbooks:
[JW] *An Introduction to Statistical Learning.* G. James, D. Witten, T. Hastie, R. Tibshirani, *Springer* 2013.
[HT] *Elements of Statistical Learning.* T. Hastie, R. Tibshirani and J. Friedman, *Springer*, 2009.
[CB] *Pattern Recognition and Machine Learning.* C. M. Bishop, *Springer* 2006.
Additional references will be posted on Piazza as needed

Homework: Expect around 4 homeworks during the semester. We will provide homework assignments together with the solutions. The homeworks will not be graded, and it is your responsibility to do the work on your own. You are most welcome to discuss the homeworks on Piazza and during office hours.

Quizzes: Expect regular (i.e., most of the classes) in-class paper-and-pencil quizzes. The quizzes will focus on conceptual aspects of the topics discussed in class, in the assigned reading, or in the homework. Please bring your own paper and pencils.

Exams: One in-class midterm exam, and one in-class final exam. The exams are closed book. You can bring to the exam one page of your hand-written notes, prepared by you, with content of your choice.

Project: During the second half of the semester, groups of approximately 3-4 students will work on a term project. The project can address methodological issues related to the topics discussed in the class, implement advanced machine learning methods from scratch, or analyze a real-world dataset. More detailed project guidelines will be posted on Piazza.

The project grade consists of project pitch (20%), project report (oral and written, 60%), and project review (20%).

AI policy: The use of AI is not allowed for in-class work (quizzes and exams). You can use AI for the project work, except when reviewing the work by another group. See project guidelines for details.

Academic integrity: All deliverables having any degree of similarity with work by anyone else, or with any other document (e.g., found online) is considered plagiarism, and will not be accepted. The minimal consequence is that all the group members will receive the score of 0, and the best possible overall course grade will be C. Additional consequences are described at `https://osccr.sites.northeastern.edu/academic-integrity-policy/` and will be strictly enforced.

Grades: All grades will be distributed via Canvas.

Re-grades of quizzes and exams: All re-grading requests should be made in writing, within **one week** after receiving the grade. The request should state the specific question that needs to be re-graded, as well as a short (1-2 sentences) explanation of why re-grading is necessary. The new grade can potentially be lower than the original grade.

Breakdown of the final grade: The final grade is based on a total of 400 points broken down into quizzes (100 pts), midterm (100 pts), project (100 pts), final exam (100 pts).

The final letter grades will follow the usual scale:

90-100 = A-range (i..e, A+, A or A-)
80-89 = B-range (i.e., B+, B or B-)
70-79 = C-range (i.e., C+, C or C-)
60-69 = D
0-59 = F
The cutoffs for '+' and '-' grades will be determined at the end of the semester, at the discretion of the intructor. This scale is subject to change at any time, at the discretion of the instructor.

Changes to final course grade: Changes to the final course grade should be requested in writing, within **one week** after receiving the final course grade. The request should contain an explanation of why re-grading is necessary. If the request is justified, the instructor will regrade **all the submissions**, including all the homeworks, the exams and the project, to determine the new grade. The new grade can potentially be lower than the original grade.