CSCI 416/516: Fundamentals of Artificial Intelligence / Machine Learning
Section 01 — Spring 2026

Instructor Information

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Class Information

Dates: January 21, 2026 - May 1, 2026
Time: M/W/F: 11:00-11:50
Classroom: Integrated Science Center 3348
Website: https://lindagaw.github.io/courses/CSCI416-Spring26/CSCI416.html

Course Description

Machine learning (ML) is a set of techniques that allow computers to learn from data and experience, rather than requiring humans to specify the desired behavior by hand. ML has become increasingly central both in AI as an academic field, and in industry. This course provides a broad introduction to some of the most commonly used ML algorithms. It also serves to introduce key algorithmic principles which will serve as a foundation for more advanced courses, such as Deep Learning.

Grading

The course grade is determined by the following components:

Homework #1	10%
Homework #2	10%
Homework #3	10%
Homework #4	10%
Midterm	20%
Final Project	20%
Final Exam	20%

Grade Scale

Final grades will be assigned according to the following scale. Grades may be curved at the instructor's discretion.

A >= 93% > A- >= 90% > B+ >= 87% > B >= 83% > B- >= 80% > C+ >= 77% > C >= 73% > C- >= 70% > D+ >= 67% > D >= 65% > D- >= 60% > F.

Textbook

There is no required textbook for this class.

Important Dates

- Final Add/drop period begins: January 20

- First day of classes: January 21

- Last day to add/drop: January 30

- Spring Break: March 7-15

- Academic Withdrawal Deadline: March 23

- Final Exam: TBD

Graduate/Undergraduate Expectations

The graduate students (enrolled in CSCI 516) are expected to complete additional coursework, compared to undergraduate students (enrolled in CSCI 416). Specifically, each exam (the midterm and the final) features additional in-depth questions for graduate students that explore the subjects in greater depth and that require additional independent reading of current research papers on the topic beyond the material covered in class. Students are expected to show an advanced understanding of the subject and the ability to master new material on the subject. This is an extra learning outcome for the graduate students. Undergraduate students are encouraged to attempt these questions for extra credits for the exams.

Learning Outcomes

- (416/516) Understanding foundational principles and algorithms in machine learning.

- (416/516) Gaining proficiency in model selection, training, and evaluation.

- (416/516) Applying machine learning techniques to real-world datasets and problems.

- (416/516) Critically analyzing the ethical implications of machine learning applications.

- (516) Engaging with current research trends and challenges in the field.

Tentative **Schedule**

Week #	Dates	Topic
0	Jan 21, Jan 23	Logistics & Teaser
1	Jan 26, Jan 28, Jan 30	Linear Regression
2	Feb 2, Feb 4, Feb 6	Optimization
3	Feb 9, Feb 11, Feb 13	Logistic Regression, Multiclass Classification
4	Feb 16, Feb 18, Feb 20	Support Vector Machines
5	Feb 23, Feb 25, Feb 27	Kernels
6	Mar 2, Mar 4, Mar 6	Decision Trees
7	Mar 9, Mar 11, Mar 13	Spring Break
8	Mar 16, Mar 18, Mar 20	Midterm Prep & Midterm Exam
9	Mar 23, Mar 25, Mar 27	Boosting & Ensemble Learning
10	Mar 30, Apr 1, Apr 3	Multilayer Perceptrons
11	Apr 6, Apr 8, Apr 10	Optimization in MLP
12	Apr 13, Apr 15, Apr 17	Convolutional Neural Networks
13	Apr 20, Apr 22, Apr 24	Attention & Transformers
14	Apr 27, Apr 29, May 1	Philosophy of AI/ML & Final Exam Preparation

This schedule is tentative and subject to change as the course progresses.

Exams

- Exams will be closed-book but you are allowed **a one-sided, US letter sized cheat sheet**. Focus will be placed on material introduced during the lecture. More details will be provided during the semester.

- Missed exams will get a score of 0 except in the case of a valid medical reason or prior approval by the instructors.

Final Project

- This course can be used to satisfy the COLL 400 requirement: your final project is expected to synthesize and apply critical analysis, solve problems in an applied and/or academic setting, create original material or original scholarship, and communicate effectively with diverse audiences. In order to guarantee this, you are required to submit a final project proposal before attempting the project itself, so that your choice of topic fits the requirement of COLL 400.

- 20% of your total mark is allocated to a final project, which will require you to apply several algorithms to a challenge problem and to write a short report analyzing the results. You are allowed to collaborate with at most 2 classmates on the final project (but not students from the other session). In other words, the maximum number of people a group can have is 3.

Submission and Late Policy

- There will be 4 homework and 1 final project in this course. The assignments will be released on the course webpage. The assignments will be collected on Blackboard. They are due at 23:59 (11:59 pm) at the due dates announced on the course website.

- We encourage typesetting using LaTeX, but scans of handwritten solutions are also acceptable as long as they are legible.

- Assignments will be accepted up to 3 days late, but 10% of the maximum allowable credits for the assignments will be deducted for each day late, rounded up to the nearest day. No credit will be given for assignments submitted after 3 days. Extensions will be granted only in special situations with valid proof (e.g. Doctor's note).

Academic Integrity

Presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in our campus policies. Please read the Honor Code at William and Mary. **If you violate this rule, you will receive an F as the final grade and be referred to the Honor's Council.**

When you refer to some source codes on GitHub, please cite them with a URL in your report. Please do not copy the answers from the Internet directly without any references. You should rephrase your answers based on your own understanding.

Accommodations

William & Mary accommodates students with disabilities in accordance with federal laws and university policy. Any student who feels they may need an accommodation based on the impact of a learning, psychiatric, physical, or chronic health diagnosis should contact Student Accessibility Services staff at 757-221-2512 or at sas@wm.edu to determine if accommodations are warranted and to obtain an official letter of accommodation. For more information, please see www.wm.edu/sas.

As per the university's guidance, if you have a religious observance that conflicts with a deadline, please notify me as soon as possible so that I can attempt to make an appropriate adjustment.