Syllabus

Class Schedule: Lecture: M W F: 11 AM – 11:50 AM (Section 01)

In-person: ISC 1111

Instructor:
Daniel Vasiliu
Office: 2269 Integrated Science Building
Virtual Office: https://cwm.zoom.us/j/99422530652
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Phone: 757-221-2113
Office Hours (in-person): M W 3 PM – 4 PM, (Zoom) T R 2 PM – 3 PM, and by appointment.

Course Description: Machine learning is the science of automating decisions and inferences based on data. It uses interdisciplinary concepts and techniques such as statistics, linear algebra, optimization, and computer science to create systems that can parse large amounts of data at high speeds and make automated predictions and decisions with or without human supervision. Machine learning is remarkably pervasive, with applications ranging from business intelligence to homeland security, medical analytics to biochemical engineering, environmental science to astrophysics, etc. This course will introduce students to a broad set of machine-learning ideas, models, and algorithms.

Course Objectives:

1. Provide students with a critical understanding of the essential aspects and techniques in machine learning and the use of data.

2. Develop students' ability to apply different machine learning methods and interpret the results.

3. Expose students to real-world problems that are being engaged with by contemporary problem-solvers and decision-makers.

Evaluation:

Class Participation	10%
Labs & Projects (4 + 4)	60%
Midterm	15%
Final	15%

The lowest score for Labs & Projects will be dropped.

Letter Grades

93 – 100 %	A	73 – 76.99%	C
90 – 92.99%	A-	70 – 72.99%	C-
87 – 89.99%	B+	67 – 69.99%	D+
83 – 86.99%	B	63 – 66.99%	D
80 – 82.99%	B-	60 – 62.99%	D-
77 – 79.99%	C+	0.0 – 59.99%	F

Resources: For programming, we use Google COLAB; for discussions and class participation, we use Piazza. For applications with Neural Networks and Deep Learning, consider getting COLAB Pro. I aim to deliver the study material in a self-content and efficient manner, so no expensive textbook is necessary; in this course, you will engage with fundamental, conceptual ideas and applications.

Labs & Projects: The labs & projects assignments will be posted on Blackboard a week before the due date. If you have any questions, please actively engage in Q/As on Piazza. Labs will involve a lot of short answer or multiple-choice questions, whereas the labs require that you design your programming approach. For projects, you will get feedback on how to improve.

Midterm and Final: An online midterm (due on March 24th) and final (May 12th) will test your knowledge of concepts presented during the course.

Important Dates: Please read the important dates and plan accordingly.

- The add-and-drop deadline this semester is February 3rd.
- Spring Break (no classes) March 11th – March 19th (Thursday – Sunday)
- The withdrawal deadline is March 27th.
- The last day of classes is May 5th.
- The Final Exam is due May 12th by noon.

Possible Changes: Any changes to the following course schedule or due dates will be announced in class and on Blackboard ahead of time.

Course Schedule:

Module 1	Preliminaries, Probability, Monte Carlo Simulations
Module 2	Reinforcement Learning, Association Rules
Module 3	Regression/Classification Problems, Support Vector Machines
Module 4	Grid Search Optimization Algorithms
Module 5	Neural Networks (with TensorFlow) and Deep Learning
Module 6	Natural Language Processing

Assignments Due Dates:

Lab 1	February 8
Project 1	February 15
Lab 2	February 22
Project 2	March 1
Lab 3	March 8
Midterm	March 24
Project 3	April 5
Lab 4	April 12
Project 4	April 19
Final	May 12

Guidance: Students performing at a C level or below must schedule a meeting with the instructor to discuss class performance.

Honor Code: Academic integrity is at the heart of the university, and we all are responsible for upholding the ideals of honor and integrity. The student-led honor system is responsible for resolving any suspected violations of the Honor Code, and I will report all suspected instances of academic dishonesty to the honor system. The Student Handbook (www.wm.edu/studenthandbook) includes your responsibilities as a student. Your full participation and observance of the Honor Code are expected. To read the Honor Code, see www.wm.edu/honor.

Student Accessibility: William & Mary accommodates students with disabilities by 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 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.

Student Health: William & Mary recognizes that students juggle different responsibilities and can face challenges that make learning difficult. There are many resources available at W&M to help students navigate emotional/psychological, physical/medical, material/accessibility concerns, including:

- The W&M Counseling Center at (757) 221-3620. Services are free and confidential.
- The W&M Health Center at (757) 221-4386.
- For additional support or resources & questions,

Contact the Dean of Students at 757-221-2510.

- For other resources available to students, see https://tinyurl.com/wmmentalhealth

Students who experience COVID-19 symptoms during the semester will have to make an appointment with the Student Health Center for a clinical assessment and testing if necessary. Students who test positive after the start of the semester and need to be quarantined must be cleared by the Student Health Center or a physician before returning to their residence hall and classes.

Living off campus? Visit the Off-Campus Isolation Guide.

The CDC calls for any COVID-19-positive person to isolate for at least five days. Visit Quarantine & Isolation Guide and Calculator for more information.

Students who test positive should complete their five-day isolation at home or off campus if that is feasible. W&M does not coordinate dedicated COVID-19 quarantine or isolation housing.

In extenuating circumstances, residential students who cannot return home must be isolated in their room for five days, attending class remotely if possible and if they feel well enough. Otherwise, they should partner with professors to arrange to be out sick for their isolation period. Visit Academic Resources & Support.

Students in isolation must always wear a mask in shared spaces to the extent they can, including shared bathrooms and residence hall rooms.

Isolating students may leave their rooms to pick up to-go items from dining halls or campus retail dining locations to pick up prescriptions or obtain medical care. They should wear a mask, practice social distancing, and limit outings as much as possible.

For more information, visit:

https://www.wm.edu/about/administration/emergency/current_issues/coronavirus/index.php

For psychological/emotional stress, contact the Counseling Center by email or 757-221-3620. For physical/medical concerns, contact the Health Center by email or at 757-221-4386.

Both are located at 240 Gooch Drive. Services are free and confidential.
If you or someone you know needs additional support or resources, please get in touch with the Dean of Students by submitting a care report online, by phone at 757-221-2510, or by email.

Expectations: All students are strongly encouraged to bring their laptops/notebook computers to class since we plan on having a significant amount of active coding.

This semester, the world continues to confront COVID infections. As we experience a surge of the pandemic with the highly transmissible omicron variant, it is reasonable to expect significant levels of infection at W&M. As an academic community based on faculty and students *convening*, fall 2022 courses will primarily consist of in-person instruction. All of us will follow W&M requirements. For those who have tested positive, W&M's requirements must be fulfilled before class can be attended in person, and, out of an abundance of caution, anyone with symptoms consistent with COVID- even if they don't have a positive test- should not come to class.

Please note that testing positive for COVID or any other temporary illness is not considered a disability defined by ADA guidelines nor under the purview of W&M's Student Accessibility Services (SAS). Thus, any questions should be addressed via email to the instructor.

For this course in the fall, the way that we will address justified student absences, the lowest lab/project score will be dropped for everyone.

We will address instructor absence/illness by scheduling remote (online) classes for no more than a week. In extreme cases, a substitute instructor will be arranged.

Consistent with W&M's belief that learning is most effective when the instructor and students convene, our course is scheduled for in-person instruction. We are still dealing with a pandemic, even as it ebbs toward an endemic. In this setting, we need to have a way to communicate when students or the instructor cannot be in person. As soon as a student knows they cannot attend class in person (either because of having tested positive, having symptoms consistent with COVID, or other health matters), please email the instructor. In that case, the instructor will activate our mode of accommodating absences for your situation. Since this is a very challenging time with the potential for quite complicated comings and goings, we need to operate based on a trustful relationship; please try your best not to miss classes for non-health-related reasons.