

PHY 4905: Machine Learning

Spring Term 2021

Syllabus

Instructor: Konstantin Matchev
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Synopsis

This is a one-semester introductory course on machine learning. You will be introduced to the fundamentals of analyzing and interpreting scientific data; you will learn to apply modern machine learning tools and techniques to problems commonly encountered in physics research, such as classification, regression, and others (for more details, refer to the class diary linked to the course webpage). Along the way, you will also acquire valuable programming, plotting, statistics and presentation skills. The course will be very interactive and will feature hands-on tutorials using Jupyter notebooks.

Prerequisites

Some knowledge of python is helpful but not required.

Time and Location

The class will be 100% online and will meet on Mondays, Wednesdays and Fridays, during period 7 from 13:55 to 14:45. The lectures will be on zoom and the link is available on canvas.

Office Hours

Office hours will be held on Mondays before class (13:00 - 13:45). You are encouraged to ask questions at any time — before, during, and after class. If you get stuck, try googling for the answer to your question before asking the lecturer or your classmates.

Required Materials

The required, recommended and a few other relevant textbooks are listed under the "References" link on the [class web page](#).

Class web page

The [class web page](#) will contain the most up-to-date information about the class. There you will find the class diary, the syllabus, useful references and the final project assignments. Please check for updates regularly, especially if you miss a lecture.

Homework assignments

There will be periodical homework assignments which could be peer-reviewed. The assignments will be posted on the class webpage on canvas. Late homework will not be accepted. Note that you are allowed to hand in the homework BEFORE the due date. Solutions should be complete, legible and functional. The homework constitutes 30% of the grade (see grading policy below).

Exam

There will be one in-class exam. The date of the exam is already announced: March 31 (Wednesday), 13:55 - 14:45. Please mark your calendars and make sure to be available to take the exam on that day, since this will be our only exam. The exam will be closed book, and calculators, cell-phones and other hi-tech gadgets will not be allowed.

Final projects presentations

The course will end with a final project presentation from each student. You will have an opportunity to choose the topic for your final project yourself — for the graduate students in the class, the final project is expected (but does not have) to be directly related to your research. If you have difficulties settling on a project topic, feel free to ask me for advice, I will then suggest different options.

Grading policy

The homework and the exam will each contribute 30% towards the final grade, while the final project presentation will count for 40%. At www.phys.ufl.edu/downloads/gradepolicy.pdf you can see the Physics Department policy on incomplete grades. For additional details regarding grading policies, see the university website:

catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

A guaranteed grading scale has been announced:

A: 80%
A⁻: 75%
B⁺: 70%
B: 65%
B⁻: 60%
C⁺: 56%
C: 52%
C⁻: 48%
D⁺: 44%
D: 40%
D⁻: 36%

These thresholds may be lowered if appropriate but they will not be raised.

Accommodations for students with disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Academic honesty

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honorcode/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.”

Online evaluations

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Advising and Counseling

Due to the nature of the environment at the university, it is not uncommon for students to experience stressful situations, and “study harder” sometimes does not seem to work. If you find yourself in this situation, you are encouraged to seek confidential counseling, see: <http://www.counseling.ufl.edu/cwc/>.

Zoom code of conduct

The [UF Student Honor Code and Student Conduct Code](#) continue to apply to online behavior. You are expected to be professional and respectful while attending class on Zoom.

CLAS zoom presence policy

The participation portion of your grade for this class will be calculated on the basis of your attendance and your participation in class activities. Normally you will satisfy this requirement through your participation through video and audio presence on Zoom. However, you may also satisfy this requirement through written comments in chat and discussion assignments in Canvas.