

PHY 7097: Machine Learning

Fall Term 2020

Syllabus

Instructor: Konstantin Matchev
Instructor's webpage: www.phys.ufl.edu/~matchev
Instructor's e-mail: matchev@ufl.edu

Synopsis

This is a one-semester introductory course on machine learning which is being offered for the first time in the UF Physics Department. In this course 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 (the exact topics which we expect to cover are listed on 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.

This is the first offering of this new course and unlike any that are being taught in our Department. As such, I ask for your feedback on any aspect of the course so that I can improve the curriculum in subsequent editions of the course.

Prerequisites

Some knowledge of python is helpful but not required.

Time and Location

The class will meet on two days of the week, during periods 3 and 4 on Tuesdays 9:35-11:30, and during period 4 on Thursdays, 10:40-11:30. The lectures will be on zoom and the link and password will be sent out in advance.

Office Hours

Official office hours will be held on Thursdays before class (10:00 - 10:30 am). You are welcome to ask questions by email at any time. Those will be answered in the order received, and typically within 48 hours whenever possible. Please, try googling for the answer to your question before asking the lecturer.

Required Materials

The main textbook is Jake VanderPlas, "Python data Science Handbook". A few other books 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.

Quizzes

You can expect to have a surprise 10-min quiz on some Tuesdays but not others. The probability to have a quiz on any given Tuesday will be 50%, thus the expected number of quizzes is 7.5. Your quiz grade for the semester will be formed by averaging your quiz scores (no drops). At least 4 quiz scores should enter the average. If you have taken fewer than 4 quizzes throughout the semester, you can request a make-up quiz only if you missed a quiz due to an excused absence.

Exam

There will be one in-class exam. The date of the exam is already announced: November 19 (Thursday), 10:40 am - 11:30 am. 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 quizzes and the exam will each contribute 30% towards the final grade, with the final project presentation accounting for the remaining 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: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

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/>.

Syllabus addendum: zoom code of conduct

The University of Florida Student Honor Code and Student Conduct Code continue to apply to online behavior. You are expected to be professional and respectful when attending class on Zoom. The following are class policies for our meetings with Zoom. Please read carefully, these policies are effective immediately and all students are expected to adhere to them.

- **Do not share your Zoom classroom link or password with others.**
- **Sign in with your full first name and last name as listed on the class roster.** Do not use a nickname or other pseudonym when you log in. However, if you prefer to be referred to by a nickname, you may add it in parentheses after your full name. Using your full name allows to quickly see who is in attendance and to sort students into their groups when needed.
- **Stay focused.** Please stay engaged in class activities. Close any apps on your device that are not relevant and turn off notifications.
- **Turn on your video when possible.** It is helpful to be able to see each other, just as in an in-person class.

- **Keep it clean.** Don't share anything you wouldn't put up on the projector in class!
- **Mute your microphone when you are not talking.** This helps eliminate background noise.
- **Breakout rooms.** When you are assigned to a breakout room, enable your webcam and microphone so that your partners may hear and see who they are working with.
- **Use a headset when possible.** If you own headphones with a microphone, please use them. This improves audio quality.
- **Be in a quiet place when possible.** Find a quiet, distraction-free spot to log in. Turn off any music, videos, etc. in the background. Make sure you are uninterrupted by other household members, including pets.
- **Stay on topic.** Use the chat window only for questions and comments that are relevant to class. The chat window is not a place for socializing or posting comments that distract from the course activities. If you fill it up with random comments, the chat moderator will be unable to sort through the information quickly to address students' real questions/concerns about the course.
- **Dress appropriately for class.** Even though you may be alone at home, your professor and classmates can see you.
- **Be aware of your surroundings.** Your professor and classmates can also see what is behind you, so be aware of your surroundings. Make sure the background is not distracting or something you would not want your classmates to see. You may use a virtual background if your device supports this feature. Be sure to avoid using backgrounds that may contain offensive images and language.
- **Follow the same rules of respectful interaction as you would in a face-to-face course.** This is especially important in a remote situation, where multiple voices attempting to speak at once result in no one being heard.
- **Refrain from eating** during the class hour, as you would in a face-to-face course.
- **No disrespect or hate speech.** Just like in our in-person class, respectful behavior is expected. Consider Zoom a professional environment, and act like you're at a job interview, even when you're typing in the chat.
- **Relax and enjoy class!** Remote learning presents some challenges but many rewards as well.