ATM 298 – Group Study
Environmental Data Science
Fall Quarter 2022, Wednesdays, 10:00-11:50 am, CRN: 23335

INSTRUCTOR

Professor Erwan Monier
Department of Land, Air and Water Resources
Office: Hoagland Hall 247
Email: emonier@ucdavis.edu

OBJECTIVES OF COURSE

The objective of this course is to introduce environmental science graduate students to recent developments in the analysis, visualization and modeling of Earth system and environmental science data using the R and/or Python languages. This course will focus on large datasets with high-dimension (time, latitude, longitude, vertical levels, additional channels) and high-resolution that are considered "big data". You will learn how to set up a GitHub repository and to version control and properly document your code. You also learn how to read, write and manipulate various types of Earth system and environmental science data (including Earth system model output). You will train on a range of statistical analysis methods and visualization techniques and you will be introduced to basic machine learning modeling. The course will be structured with a 2-hour group discussion per week, where you will be provided hands-on experience with R and Python programming exercises.

COURSE MATERIALS

All course material will be provided/administered via the Canvas course web page: http://canvas.ucdavis.edu. We will also use DataCamp courses for R and Python programming exercises: https://www.datacamp.com.

COURSE GRADING

Programming exercises – 50%: You will be expected to complete weekly programming exercises and maintain a code diary where you will log all the questions and issues you faced and all the solutions you implemented.

GitHub repository – 25%: You will be expected to set up a GitHub repository and to version control and document all the code you will develop during the course on your repository.

Participation – 25%: You will be graded on your participation in group discussion on each of the week's main topics.

The letter grade for the course is determined at the end of the year, approximately following standard guidelines (91-100% A, 81-90% B etc.) but may be "curved" if the class median grade falls below C+/B-. For Satisfactory/Unsatisfactory (S/U) grading, the grade of 'Satisfactory' is awarded for a grade of B- or better.

COURSE FORMAT

Week #1:	Introduction to R/Python and Earth system data
	Installation of RStudio/Jupyter
	Earth system and environmental data formats/sources
Week #2:	Introduction to version control and reproducibility issues (intro to Github)
	Reading, writing and manipulating Earth system and environmental data
Week #3-4:	Statistical analysis
Week #5-6:	Data visualization tools
Week #7-8:	Mapping and geospatial techniques
Week #9-10:	Intro to machine learning

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LAND ACKNOWLEDGEMENT

It is important to acknowledge the land on which the UC Davis campus is located. For thousands of years, this land has been the home of Patwin people. Today, there are three federally recognized Patwin tribes: Cachil DeHe Band of Wintun Indians of the Colusa Indian Community, Kletsel Dehe Wintun Nation, and Yocha Dehe Wintun Nation. The Patwin people have remained committed to the stewardship of this land over many centuries. It has been cherished and protected, as elders have instructed the young through generations. We are honored and grateful to be here today on their traditional lands.

To honor this legacy and ensure people remain aware of the land they are on, UC Davis has designed several installations in consultation with Patwin Elder Bill Wright and his family, in addition to faculty and students from Native American Studies, staff of American Indian Descent (SAID), as well as representatives from Student Affairs, the office of Finance, Operations and Administration and the UC Davis Arboretum and Public Garden. The Native American Contemplative Garden is part of this effort.

COLLABORATION POLICY

In this class, we permit students to discuss the concepts and ideas of the assignments with each other, but we require that students then do the assignment independently (i.e. by themselves – alone). If your assignments are identical or highly similar to those of another student, we will know that you worked together beyond what we allow and we will report you to the Office of Student Support & Judicial Affairs (OSSJA). Working together when not allowed, or beyond what *is* allowed, is called "unauthorized collaboration" and is a violation of our Code of Academic Conduct.

PLAGIARISM

Any time you use the research, ideas, images, analysis, language, etc. of another, you *must* cite that individual (give them credit). If you use the words of another author verbatim (word-for-word), you must indicate that by putting the words in quotation marks. As a UC Davis student, you are expected to know when and how to cite and paraphrase correctly. If you do not, ask me or your TA for help. Submitting work that contains work "borrowed" from others and not properly cited is called "plagiarism" and is a violation of our Code of Academic Conduct.

Plagiarism and other anti-intellectual behavior cannot be tolerated in any academic environment that prides itself on individual accomplishment. If you have any questions about the collaboration policy, or if you feel that you may have violated the policy, please talk to one of the course staff. Although the course staff is obligated to deal with cheating appropriately, we are more understanding and lenient if we find out from the transgressor himself or herself rather than from a third party.

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STUDENT DISABILITY CENTER (SDC)/CLASSROOM ACCOMODATIONS

UC Davis is committed to educational equity in the academic setting, and in serving a diverse student body. I encourage all students who are interested in learning more about the Student Disability Center (SDC) to contact them directly at sdc.ucdavis.edu, sdc@ucdavis.edu or 530-752-3184. If you are a student who currently receives academic accommodation(s), please submit your SDC Letter of Accommodation to me as soon as possible, ideally within the first two weeks of this course.