

Economics 105: Data Tools for Sustainability and the Environment (tentative, subject to minor changes)

Course Description:

This course introduces students to data analysis for use in addressing sustainable business and policy questions. By the end of this course, students will be able to analyze real-world data within the Jupyter/Python programming environment. It will focus on real-world applications such as the White House's environmental justice proposals; emissions monitoring; and assessing plastic waste for the Government of Indonesia.

Syllabus:

This syllabus contains a lot of important information. If you do not read it carefully, you may run into problems later on, particularly with respect to exams. If something bad happens to you that could have been avoided by reading the syllabus, I will not provide accommodations. If you email me a question that is answered on the syllabus, I will refer you to the syllabus.

Prerequisite:

Students should have a familiarity with basic statistics (e.g., Statistics 2) and microeconomics (e.g., Environmental Economics and Policy 1, or preferably Environmental Economics and Policy 100) or consent of instructor. This course may be used for the Minor and Certificate in Sustainable Business and Policy.

Textbooks:

[Coding for Economists](#) (online open source)

About: The book aims to give you the skills you need to code for economics, while also giving you tips and tricks about programming more generally that might be useful to you. If you're a complete beginner at coding, we have designed the first chapters to help you get started from scratch. But if you've dabbled before, or even if you're a sophisticated coder, there's likely to be material here relevant to you too.

McKinney, W. (2022) *Python for Data Analysis: Data Wrangling with pandas, NumPy, and Jupyter*, 3rd Edition. O'Reilly Media, Inc. open access: <https://wesmckinney.com/book/>

About: Written by Wes McKinney, the creator of the Python pandas project, this book is a practical, modern introduction to data science tools in Python. It's ideal for analysts new to Python and for Python programmers new to data science and scientific computing. Data files and related material are available on GitHub.

Teaching Team:

Instructor: Xiangyi Meng (mxywp@berkeley.edu),

Lectures: MTuW, 10:00am – 11:59am, online/synchronous

GSI: Jesse Kozler (kozler@berkeley.edu),

Discussions: Th 9:30am – 10:59am, online/synchronous

My office Hours:

I am very available. I will hold zoom office hours. You can schedule an appointment (chat by zoom) at <https://calendly.com/xmeng2390/chat-with-prof-meng>. More will be provided if necessary. My office hours will be one-on-one, and are for everything other than problem sets and exam prep: course material, school, career, life, etc. I will talk about problem sets and exams after the due date.

Email:

My email address is mxywp@berkeley.edu. Feel free to email me about anything you like, but please maintain professionalism in your emails: begin each email with “Prof. Meng,” use complete words, sentences, and paragraphs, and include your name at the end. After this course, you are welcome to call me Xiangyi. And you must include “ENVECON 105” in the subject line. You can’t imagine how many emails every professor receives daily!

Website:

Everything will be on bCourses. You are responsible for reading all of every email sent from bCourses. If you run into problems that could have been avoided by reading an email more carefully, I will not provide accommodations.

Outline of Lectures:

Week 1	Introduction to Python and the Python Data Analysis (Pandas) Library
Week 2	The crucial methods in data manipulation and essential statistics
Week 3	Data Visualization and Statistical Analysis
Week 4	Spatial Data and Spatial Analysis
Week 5	Applications in global CO2 emissions
Week 6	Dashboard and Machine Learning

Grading:

The Grades tab in bCourses will tell you your scores on problem sets and exams but it will not be used for computing your score or letter grade for the class. **Do not** draw any conclusions about your final score or letter grade from the information on bCourses. It is absolutely not the case that, for example, a score of 90% will earn you an A. **You cannot infer your letter grade from the information on bCourses.**

This is a 3-unit course, which means that you can expect 15 hours of outside work per week. Grading will not be on a curve; if everyone does well, everyone will get a good grade. The table below summarizes the work and contribution to the overall course grade.

Cheating on a quiz, midterm or the final will result in an F for the course. Incidences of cheating will be reported to the Center for Student Conduct, which may administer additional punishment.

Category	% of grade	Notes
Class participation	20%	<ul style="list-style-type: none"> • Polls will be part of your grade. • There will typically be multiple polls per day. • Sometimes the software doesn't work well, or you have to miss class for an interview or competition or because you are sick. Thus, we will drop the 3 class days on which you have the lowest scores. • We will typically have polls in the middle of class. • <u>You need to have a clicker account by the second day of class.</u> Please subscribe and open an account. Here is the link to join this class: https://join.iclicker.com/SRLV. And for more resources: https://rtl.berkeley.edu/services-programs/student-response-systems/students-getting-started-iclicker-cloud. <p>NB: if you run across a technical glitch during the lecture, you must bring this issue to me immediately after the lecture.</p>
Labs	40%	<ul style="list-style-type: none"> • There will be up to 5 weekly labs, due each Monday noon (at 12:00PM Pacific Time). Each lab roughly corresponds to what you have learned in the past week. • Late policy: (i) No credit can be awarded for submissions received 24 hours after the deadline, and (ii) assignment extensions are not possible and would constitute what UCB calls a “fundamental alteration of the course.” (iii) late submissions will receive partial credit that declines linearly from 100% if submitted on time to 0% if submitted 24 hours late, i.e. $100\% - (\text{hours late})/24$. • The one exception is that any students who join the class late can submit any problem sets they missed by the Sunday after they join. • When computing final grades, we will exclude the one lab assignment on which you have the lowest grade. • DSP students with assignment extension approvals: you have one-day extension without penalty. If you need more extension, please consider withdrawing from this course as this would constitute what UCB calls a “fundamental alteration of the course.”
Individual Projects	20%	<ul style="list-style-type: none"> • There will be 2 individual projects, each of which takes about two weeks to complete. • If you miss any project with an excuse that meets University standardsⁱ, I will reweigh all the assignments.
Group Project	20%	<ul style="list-style-type: none"> • More guidance will be provided separately.

Honor code:

The ASUC asks that faculty include the following language in their syllabuses:

“The student community at UC Berkeley has adopted the following Honor Code: ‘As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others.’ The hope and expectation is that you will adhere to this code.”

This is an admirable aspiration, but in my experience it's easy to lose sight of what 'honesty, integrity, and respect for others' really means. Here's a suggestion. If even a small voice within you says "I would not want my fellow students, my parents, or my professor to know about this," stop! And ask yourself what matters more, the short-term gain you were about to grab, or the respect of others, your own self-respect, and the honor of your family, all of which must be earned and jealously guarded over the long term.

Asking for Help:

Feel free to approach me about anything that is affecting your learning or your academic success. You are unlikely to have any difficulty that has not been shared by thousands of students before you, including, in most cases, myself. Everyone needs help. Embarrassment, shame, and fear are not good excuses for not getting help.

Here are some useful links to on-campus resources.

- Student learning center: slc.berkeley.edu
- Econ tutors www.econ.berkeley.edu/undergrad/home/tutoring
- Disabled Students' Program: dsp.berkeley.edu
- Counseling (Psychological, Psychiatric, Social Services, and Career Counseling): <https://uhs.berkeley.edu/counseling>

ⁱ Religious holidays must be recognized by the University or accompanied by a letter from a religious leader. Schedules for official team events must be provided to me by the end of the second full week of the semester. A death in the family must be documented. Illness or injury must be accompanied by a note from a physician or clinic, on their letterhead. Please note that extreme stress and other psychological symptoms can count as a legitimate medical excuse. The Tang Center can provide you with documentation.