

Tools for Computational Social Science

ECON GA 4001

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Summer

0 credits

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Course Description

This course introduces several key tools which will be used for the rest of the certificate program. It covers the basics of the Python programming language, basic software engineering, and git as a version control tool.

This course is to be completed online at your own pace, but must be completed prior to the first day of the Computational Social Science Certificate program. We expect the median student to take a few weeks working 10-15 hours per week to complete this course, but those with a less/more technical background may take somewhat more/less time to learn this material. It is important fully to understand this material because it will provide foundations for succeeding in the program.

Course Materials

- **QE** Various lectures from QuantEcon available at <https://quantecon.org>
- **Software Carpentry** We will use materials from the Software Carpentry organization available at <https://software-carpentry.org/>

Prerequisites

The only prerequisite for this course is good attitude and a willingness to work hard

Course Objectives

This course provides a foundational knowledge of programming and software engineering. This foundation will give students tools needed successfully to master the programming component of the Computational Social Science Certificate.

Upon completion, a student should be able to,

- open and edit a Jupyter notebook
- write basic Python code that is readable and well-documented
- use git version control to manage and share their documents

Course Structure

This course will be operated completely online and at your own pace. You must have completed this course prior to beginning the certificate program. The learning material can be found online through the class website.

Assessments

This course will be graded on 4 assignments corresponding to the 4 course modules.

We encourage students to work together. We believe that this is the best way to learn this type of material, however, we caution students against allowing others to do work that you do not understand — In future courses, there will be tests and projects that rely on the skills acquired in this course and you will be at a disadvantage if you are not prepared.

Grading Policy

Each of the 4 assignments are worth 25% of the course grade. The only due date is that all of the assignments are completed prior to the first official day of classes.

Grading policy: A =100-90%; A- = 90-85%; B+ = 84-80%; B = 79 - 70%; C = 69 - 50%; D = 49 and lower

Schedule and weekly learning goals

The schedule is tentative and subject to change. The learning goals target the key concepts you should grasp after each week. Material builds progressively on earlier materials.

Module 01: Jupyter Notebook, **QE Data Science: Getting Started/QE Python: Getting Started**

- Jupyter Notebook overview
- Editing a Jupyter notebook
- Using Jupyter notebook as a reporting tool

Module 02: Python Basics, **QE Data Science: Python Fundamentals**

- Python Fundamentals
- Editing and running a Python script
- Best practices for coding

Module 03: Version Control, **Class notes**

- Basic git commands
- git workflow

Module 04: Software Engineering, **Class notes**

- Testing Python code
- Test driven development
- Documentation

Course Policies

Professional Behavior

Attend class. They say “eighty percent of success is just showing up.” We have found that those who show up perform systematically better.

Arrive to class on time and stay until the end of class. Chronically arriving late or leaving class early is unprofessional and disruptive to the rest of the class.

We understand that the electronic recording of notes will be important for class and so computers will be allowed in class. Please refrain from using computers for anything but activities related to the class. Phones are prohibited as they are rarely useful for anything in the course. Eating and drinking are allowed in class but please refrain from it affecting the course. Try not to eat your lunch in class as the classes are typically active.