

SYLLABUS

MATH 3350

Scientific Computing with Python

Spring 2023

Time: 12:45 – 2:00 PM, TR

Room: Classroom South 210

Instructor: Dr. Yi Jiang (yjiang12@gsu.edu)

Office: 25 Park Place, office 1425

Office Hours: online (Webex) Tuesdays @14:30-16:00, or by appointment

Prerequisite: Grade of C or higher in Math 2215 or Math 2641

Textbooks (all freely available online):

Python for Everybody (*Chuck Severance*)

<https://www.freecodecamp.org/learn/scientific-computing-with-python>

How To Think Like A Computer Scientist: Learning with Python 3 (*Peter Wentworth, Jeffrey Elkner, Allen B. Downey, and Chris Meyers*)

Learning Objectives:

- (1) understand the basic concepts of programming and computing
- (2) gain working knowledge of scripting/programming using Python for computing, data processing and visualization
- (3) learn useful functions from linear algebra (e.g. matrix inversion, eigenvalues), differential equations (ODEs), data analysis (e.g., mean, standard deviations, linear regression), and
- (4) solve real world problems using scientific computing with Python programming.

By the end of this course, students will be able to understand Python codes and write short Python programs to solve simple mathematical problems, including solving equation systems numerically, analyze and visualize data, and conduct research project.

College to Career Competencies addressed:

Critical Thinking/Problem Solving:

Mine and analyze data, Analyze visual data

Teamwork/Collaboration

Collaborate in team-project, participate in collaborative writing

Digital Technology

Design creative digital solutions, translate data

Attendance policy: All students are expected to participate in all classes.

Additional Attendance Policy: Students seeking excused absences through the Dean of Students Office may submit documentation to <https://deanofstudents.gsu.edu/student->

assistance/professor-absence-notification/. I will then be notified by the Dean of Students of any excused absences.

Assignments: There will be seven assignments (Assignment 1 – Assignment 7) in this class. The assignments will become slightly more difficult and require more time as the semester progresses. Thus, the later assignments will be weighed slightly more than the earlier ones. The assignments will be graded according to the following scale:

AAA An absolutely fantastic submission of the sort that will only come along a few times during the semester.

AA A submission that is "perfect" or exceeds our standard expectation for the assignment. To receive this grade, a program often reflects additional work beyond the requirements or gets the job done in a particularly elegant way.

A A submission that satisfies all the requirements for the assignment, showing solid functionality as well as good style. It reflects a job well done.

BB A submission that meets the requirements for the assignment, possibly with a few small problems.

B A submission that has problems serious enough to fall short of the requirements for the assignment.

C A submission that has extremely serious problems, but nonetheless shows some effort and understanding.

D A submission that shows little effort and does not represent passing work.

Late policy: Each of the assignments is due at **the start of class** on the dates specified in the assignments. Anything that comes in after **12:00p.m.** will be considered late. Because each of you will probably come upon sometime during the semester where so much work piles up that you need a little extra time, every student begins the semester with four free "late days." Each "late day" is a 24-hour **period (i.e., from Tuesday at 12:00p.m. to Wednesday at 12:00p.m. is one late day)**. Your free late days allow you to turn in assignments past the regular deadline without penalty (until you have used them all). After the free late days are exhausted, submissions that come in late (up to a maximum of five days late) will be assessed a late penalty of one grade scale per day (e.g., a **A** turns into a **BB**, and so forth). Assignments received later than five days following the due date will not be graded.

You should think of these free late days as extensions you have been granted ahead of time and use them when you might have otherwise tried to ask for an extension. As a result, getting an extension beyond the four free late days will generally not be granted. In *very special* circumstances (primarily medical problems or other emergencies), extensions may be granted beyond the late days. All extension requests must be directed to the professor no later than 24 hours **before** the assignment is due.

Examinations: There will be two mid-term exams during this class, the dates of each of these tests will be announced about one week in advance. There will be no final exam. There will be no make-up exams except in an extreme, verifiable emergency.

Project and presentation: The students will form teams of 2-4 to work on a project, give a final presentation and write a final report.

Grading:

Class participation (10%) + graded assignments (50%) + two tests (20%) + one team project (20%)

Score	0-59	60-69	70-76	77-79	80-82	83-86	87-89	90-92	93-96	97-100
Grade	F	D	C	C+	B-	B	B+	A-	A	A+

Academic Dishonesty: Plagiarism and cheating are serious offenses and may be punished by failure on the exam. Repeated cheating will result in a grade F for the course.

Wearing Masks in Class: You are encouraged to wear a face covering in all class meetings.

This course syllabus provides a general plan for the course; deviations may be necessary.