Syllabus for MTH 493/593
Introduction to Computational Mathematics

Fall 2022: August 29 – December 17

1 Course Information

Instructors:	Dr. Alexander P. Hoover and Dr. L. Felipe Martins.
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Office Hours:	MWF 2:30pm–3:30pm or by appointment (Martins)
	MTW 3:30pm–4:30pm or online/by appointment (Hoover)

2 Recommended Textbook

Lutz, Mark *Learning Python*, 5th ed (June 2013).

The textbook is available online free of charge to CSU students. Go the the library e-books page:

https://library.csuohio.edu/research/vrd/ebooks.html

and search for *Safari Books Online*. Click on the link and create an account. Once you access the Safari site, search for *Learning Python*.

3 Course Description and Topics

This course is an introduction to computational mathematics using the Python computer language.

1. Introduction to Python
   (a) Programming Python in the Jupyter Notebook.
   (b) Operations with integers and doubles, including built-in mathematical functions.
   (c) Using variables to store values.
   (d) Using lists to store collections of values.
   (e) Using strings to represent textual information.
   (f) Programming structures: if tests, for loops and while loops
   (g) Functions.
   (h) Introduction to object oriented programming from the point of view of using libraries.

   (i) Introduction to the Python documentation.

2. Modules, packages and the standard library.
3. Numpy: efficient arrays for scientific computing.
4. Mathplotlib: professional quality graphs
5. Scipy: advanced scientific computing algorithms.
6. Pandas: structures for data science
7. Scikit-learn: machine learning algorithms (time permitting).

4 Learning Resources

- **Blackboard Learn (BBLearn)**: This course uses the CSU online course management system: https://www.csuohio.edu/center-for-elearning/blackboard-login. Visit the site frequently for course information, discussion boards, supplemental material, useful links, and other resources.

5 Course work and grading

5.1 Class Participation (10 points)

This is a hands-on course and students are expected to actively participate in class. Class meetings will be structured around learning activities, and working on these activities is essential to be successful in the course. Participation credit is given according to completion of in-class tasks. At the end of the semester, points are awarded for participation according to the following table:

Participation score	Participation points
90% or more	10
80% to 90%	5
less than 80%	0

5.2 Quizzes (20 points)

Quizzes are designed to check the understanding of basic programming concepts. Each quiz is a short in-class test that requires the use of a computer. The topics and dates of quizzes will be announced at least three days before the quiz takes place.

When computing the quiz score at the end of the semester, the lowest score is dropped. Please notice that *no makeups are given for missed quizzes*. Students that, due to a health or family emergency, are required to have an extended absence should contact the instructor immediately to make arrangements to make up for missed work.

5.3 Projects (70 points)

Students will be required to work on several projects during the course, including a final project. Projects explore applications of the programming concepts studied in class. The final project is designed to give students an opportunity to work on a major application area. Project topics will be announced during the course.

Calculator Policy:

5.4 Grade assignment

Grades are assigned according to the following table:

Undergraduate	
Percent score	**Grade**
95 to 100	A
90 to 94	A-
85 to 89	B+
83 to 84	B
80 to 82	B-
75 to 79	C+
70 to 74	C
60 to 69	D
59 or less	F

Graduate	
Score	**Grade**
95 to 100	A
90 to 94	A-
85 to 89	B+
83 to 84	B
80 to 82	B-
70 to 79	C
69 or less	F

6 General Policies

6.1 Grade reporting and disputes

All student scores will be posted in Blackboard as course work and tests are done. Students are responsible for checking their own progress, and reporting to the instructor any discrepancies as soon as they are noticed. It is also strongly suggested that you retain all graded work from the course until the end of the semester and grades are posted. This way if a dispute arises concerning a recorded grade and the actual grade, we have the documentation needed to rectify the situation. Additionally, graded works make for excellent study materials for upcoming exams.

6.2 Class Conduct

Class attendance and participation is essential for success in this course. Please come to class prepared, and take an active role in class discussions and activities.

Please bring a graphing calculator to each class. Cell phones should be turned off or placed on silent. Text messaging during class is not appropriate and grounds for removal from class. During computer

lab sessions, checking email and surfing the web is inappropriate when the instructor is talking and again grounds for removal from the class. Other serious disruptions are grounds for removal as well.

6.3 Withdrawals

Last day to withdraw is **November 4**. Withdrawing from the course may put you in violation of the federally mandated standards for academic progress (SAP) that you must maintain to be eligible for financial aid. Read the link on the course website for information about the implications of withdrawing from the course for your financial aid or visit Campus 411.

6.4 Scholastic Dishonesty

Cheating and/or plagiarism will not be tolerated. "Cheating" includes copying or receiving help from another student on quizzes, tests or exams, as well as allowing another student to copy from your work. Copying another student's homework, or allowing someone else to do your homework for you, is also considered cheating. If cheating occurs in a quiz or unit test, the student will receive a grade of 0 for that component of the course. If cheating occurs in the final exam, the student will receive a grade of F in the course. Any cheating activity may be reported for further action. Information regarding the official CSU policy regarding cheating and plagiarism can be found in the CSU Code of Student Conduct at https://www.csuohio.edu/compliance/student-code-conduct

6.5 Disabilities Statement

Educational access is the provision of classroom accommodations, auxiliary aids and services to ensure equal educational opportunities for all students regardless of their disability. Any student who feels he or she may need an accommodation based on the impact of a disability should contact the Office of Disability Services at (216) 687-2015. The Office is located in MC 147. Accommodations need to be requested in advance and will not be granted retroactively.

6.6 Disclaimer

The course instructor reserves the right to modify these procedures as the course progresses, and to change the assignment schedule from the outline given. Any changes will be announced in class with adequate advance notice. You are responsible for being aware of any changes discussed in class and/or in the BBLearn course site. This includes exam days, homework due dates and changes in policy.