

MATH 246: Mathematical Computing and Programming Laboratory, Spring 2020

Classes meet: Thursday, 1:40-4:10 pm in Maybank 200.

Prerequisites: MATH 220, or permission of the instructor.

Text: None: online and printed materials will be provided.

Instructor: Brenton LeMesurier

Office: Robert Scott Small Building, room 344.

Phone: 953-5917, messages 953-5730 (but email is better for messages)

Email: lemesurierb@cofc.edu

Web Site: <https://blogs.cofc.edu/lemesurierb/>

Office Hours: To be arranged.

For now I am available from 10–11am on Monday, Wednesday and Thursday, and immediately after each MATH 245 class

There is a site for this course in the College's Learning Management System OAKS at <https://lms.cofc.edu>. This will be used for you to submit your programming work, and for me to respond with comments, suggestions for revisions, and grading.

Course Objectives and Student Learning Outcomes

The main expectation of this course is that students learn how to use computational software (such as a Python 3 programming environment) to implement algorithms for computing numerical solutions to mathematical problems, and to present results appropriately with graphs, tables and written discussions. This will usually be done in conjunction with taking the course MATH 245, but work in this course can be done based only on mathematical methods already seen in earlier courses, such as calculus and linear algebra.

Undergraduate Mathematics Program Student Learning Outcomes

This course can be used to satisfy some requirements of the undergraduate mathematics degree program, for which there are also some standard objectives.

1. Using algebra, geometry, calculus and other track-appropriate sub-disciplines of mathematics, students will model phenomena in mathematical terms.
2. Using algebra, geometry, calculus and other track-appropriate sub-disciplines of mathematics, students will derive correct answers to challenging questions by applying the models from the previous Learning Outcome.
3. Students will write complete, grammatically and logically correct arguments to prove their conclusions.

These outcomes will be assessed on the basis of the work on numerical integration.

Computers and Software

We will use the programming language Python 3 together with some add-on packages for scientific computing, like Numpy and SciPy for numerical computing tools, and Matplotlib for graphics. No familiarity with this software or computer programming is assumed; learning all that is what this course is for!

This software is most easily accessed through the free integrated development environment Spyder. We will also use the IPython/Jupyter interactive notebook system. That is most easily accessed through Anaconda, which also includes a version of Spyder: see <http://www.continuum.io/downloads/> for some installation options.

Coursework and Assessment

The work for this course will consist of about ten units, with an initial version of the work for a module submitted one week, and often revisions done for the following week, on the basis of my feedback. Extensions beyond the second week can be got, but with a grade penalty.

Grading is based on successful completion after possible revisions, not partial credit for submissions that are incomplete or do not give correct results. Thus the grading scheme for each module will be:

5 ("A"): Complete and correct in all respects.

4 ("B"): Mostly complete and correct, but with minor omissions or room for refinement.

3 ("C"): Some parts complete, but with significant gaps.

Incomplete/ungraded: Feedback comments only: must be revised or completed to get to a grade.

I will give a lot of feedback and allow several revisions: with programming and most mathematics, working and checking until you get things completely right makes a lot more sense than partial credit for results that are partially wrong!

Before leaving the class each week, you should discuss your work with me, even if you know that it is unfinished. Then most work will be submitted to a dropbox in OAKS, though some units will involve written work. I will respond through OAKS with comments, and either suggestions for revisions or a final grade.

Final Grading

The module grades will be averaged and converted to a final grade on the scale:

[4.8, 5] for an A,

[4.5, 4.8) for an A-

[4.2, 4.5) for a B+

[3.8, 4.2) for a B,

[3.5, 3.8) for a B-

[3.2, 3.5) for a C+

[2.8, 3.2) for a C,

[2.5, 3.8) for a C-, etc.

(Exercise: explain why perfect completion of any eight units is enough for a B!)

If you keep up with revisions, it is possible to finish the work for this course before the last weeks of class: the remaining meeting time will be available to revise work on earlier units to improve your grades, and/or supervised work on programming projects for MATH 245.

Accommodations for Students with Disabilities

If you have a documented disability, please contact me during the first two weeks of class or as soon as you have been approved to receive accommodations, so that reasonable accommodations can be arranged. Approval for such accommodations is arranged through the Center for Disability Services: see

<http://disabilityservices.cofc.edu/accommodations/>

College of Charleston Honor Code and Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Cases of suspected academic dishonesty will be reported directly to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration – working together without permission – is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' exams, fabricating data, and giving unauthorized assistance.

Students can find the complete Honor Code and all related processes in the Student Handbook at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/>

Some Important Dates and Times

Thursday January 8	First class meeting.
Wednesday January 15	Last day to drop/add courses.
Saturday February 15	Storm make-up day, if needed.
Friday March 13	Last day to withdraw with a grade of "W".
March 15–21	Spring Break — no classes.
Thursday April 16	Last class meeting.
Monday May 4	Grades available on MyCharleston by 5pm.