COURSE DESCRIPTION
SCIENTIFIC PROGRAMMING
MA 560-1B
FALL 2021

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Dr. Carmeliza Navasca
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Preferred Methods of Contact: Email is the preferred method of contact if you have questions. Please expect a response within 24 hours on weekdays and a slower response on weekends (OR Emails received after 5 pm on Friday will be returned Monday morning). Include course number in the subject line of your email for a faster response. I am available to meet with you virtually via Zoom by appointment during my virtual office hours (see below for my scheduled virtual office hours).
Office Hours: TBA

Course Info

Meeting times: Mon/Wed/Fri, 9:05–9:55 AM Central Time
Meeting location: HHB 221
Prerequisite: Grade of C or better in MA 126 or equivalent. *Any student who has not fulfilled the prerequisite will be dropped from the class.*
Credits: 3 semester hours
Required Textbook: (1) *Insight Through Computing: A MATLAB Introduction to Computational Science and Engineering* by Charles F. Van Loan and K.-Y. Daisy Fan, SIAM, 2010.
  (2) *Think Python: How to Think Like a Computer Scientist* by Allen B. Downey, O'Reilly, 2nd Edition, 2015. Free PDF at
  `http://greenteapress.com/thinkpython2/thinkpython2.pdf`
  (3) *Scientific Computing with Python 3* by Claus Fhrer, Jan Erik Solem, Olivier Verdier. Free PDF in Canvas.
  (4) *Class Notes: MA 360/560, Scientific Programming* by Ian Knowles. (Recommended)

Important Dates

First day of our class: August 23, 2021
Last day to drop without paying full tuition: August 30, 2021
Fall and Thanksgiving Break: November 22–November 28, 2021
Last day of our class: December 3, 2021
Final Exam/Project Due Date: Wednesday, December 8, 2021

Course Policies

- Please make sure that you are able to receive e-mail through your Blazer-ID account. Official course announcements may be sent to that address.
- If your are contacted by the Early Alert Program, you should consider taking advantage of the services it offers.
- If you wish to request a disability accommodation please contact DSS at 934-4205 or at *dss@uab.edu*. See below for COVID-19 Temporary Adjustments.

Course Description

Programming and problem solving using Matlab and Python. Emphasizes the systematic development of algorithms and programs. Topics include iteration, functions, arrays, Matlab graphics, image processing and robotics. Assignments and projects are designed to give the students a computational sense through complexity, dimension, inexact arithmetic, randomness, simulation and the role of approximation.

Objectives of the Course

Upon successful completion of the course, a student

(1) develops and implements algorithms from a mathematical given problem;
(2) develops programming skills to produce working codes;
(3) learns the basic principles of scientific computing, i.e. algorithms and software tools for science, math and engineering problems

Class Management via Canvas

- Homework problems will be posted in canvas (`http://www.uab.edu/online/canvas`). All other materials (class announcements, codes, grades and etc.) will be posted in canvas. Students should log in to canvas everyday.
- Homework assignments, projects and activities will only be collected on canvas.

Assessment Procedures

- Student achievement will be assessed by the following measures:
  - **Weekly homework.** Homework will be assigned on a weekly basis. There will be no extension of deadlines for any reason. Late homework will be not be accepted. Homework contributes 15% to the course average. Graduate students and students in the honor's program will do extra homework problems as provided by the instructor.
  - **Projects.** Each project contributes 10% to the course average. There will be six projects. (We may have less than six projects or more than six projects. Thus, the individual project contribution will be adjusted accordingly.) The graduate students and students in the honor's program will do extra problems within the projects.)
  - **Final project.** The final contributes 25% to the course average.

Grading Scheme: 15 % homeworks, 60 % projects and 25% final project

- Your course performance is your course average (including the final exam score). This is a number between 0 and 100.

- Your final grade is determined according to the following table:

Course performance:	88-100	75-87	50-74	below 50
Final Grade:	A	B	C	F

- There will be a group project or activity in this course. Please make sure to check the group project instructions page to locate your group and your group space in Canvas. In this group project activity, you will collaborate with other students to submit a report/video/ presentation. As a team, you will work together to break the project up into separate tasks and decide on the tasks or sub-tasks each member is responsible for. Be sure to leave enough time to put all the pieces together before the group assignment is due and to make sure nothing has been forgotten. At the end of the project, you will be required to fill out a group self-evaluation form to evaluate other team members contributions to the project. This peer evaluation score is worth 15% of your group project grade.

Tips

- By working steadily and regularly, you will increase your chances to succeed in this course.
- Remember, being a full-time student is a full-time job.

Masking Requirements

Mask-wearing has proven to be one of the most successful mitigation strategies used to combat spread of the various variants of the COVID-19 virus. UAB requires face coverings indoors on campusregardless of vaccine status. Students who do not follow this requirement can be reported to Student Conduct.

Students will be asked to wear a face covering and if the student is noncompliant, the student will be asked to leave the classroom/lab. As a last resort, class will be dismissed if a student refuses to wear a face covering.

We strongly urge you to be fully vaccinated. Here is information on the safety of vaccines and on how to get vaccinated at UAB (`https://www.uab.edu/uabunited/covid-19-vaccine`). There you will find incentives for getting vaccinated.

Academic Honor Code

The University of Alabama at Birmingham expects all members of its academic community to function according to the highest ethical and professional standards.

Academic misconduct undermines the purpose of education. Such behavior is a serious violation of the trust that must exist among faculty and students for a university to nurture intellectual growth and development. Academic dishonesty and misconduct includes, but is not limited to, acts of abetting, cheating, plagiarism, fabrication, and misrepresentation.

It will be important that you review and become familiar with the Universitys Academic Integrity Code (`https://www.uab.edu/faculty/resources/academic-integrity-code`)

Non-harassment, Hostile Work/Class Environment

The UAB College of Arts and Sciences expects students to treat fellow students, their Course Instructors, other UAB faculty members and staff as adults and with respect. No form of hostile environment or harassment will be tolerated by any student or employee.