

EAS 31119/ EAS B9039: Introduction to Scientific Computing
Room: NAC 1/302, Times: Mon & Wed. 3:30pm - 4:45pm

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Course Summary: This course will serve as an introduction to using computer programming for data analysis. Starting from the basics, this course will work through concepts on the fundamentals of programming, statistical analysis, and numerical analysis. Students will learn best practices for programming, methodologies for developing codes for large-scope analysis, and details on obtaining data. The course will focus on climate related data, but the lessons will be applicable to any discipline. No prior experience with computer programming is expected.

Prerequisites: None

Course Details: All coding will be completed using Matlab.

Course Topics

- Programming basics: data types; loops; generating plots; scalable code design.
- Numerical differentiation and integration
- Downloading data and reading in binary and netcdf files and correlation analysis
- Solving simple, coupled differential equations: the Lorenz 1963 model (i.e. “chaos”)

Grading Rubric:

Homework: 70%

Exams (3): 30%

Graduate Students will have an additional project as part of the course.

Grading Rubric for Graduate Students:

Homework: 50%

Small Project: 20%

Exams (3): 30%

Expectations/Rules: Be respectful of your fellow students and the professor; do not act out in a way that prevents others from learning or dissuades others from participating. ***Plagiarism, dishonesty, or cheating in any portion of the work required for this course will be punished according to City College regulations. Read more about the CCNY Policy on Academic integrity at:***
<http://www1.ccny.cuny.edu/upload/academicintegrity.pdf>

Learning Outcomes:

1. Be comfortable in calculating statistics on 4-dimensional datasets
2. Apply numerical derivative and integration techniques
3. Utilize loops, dictionaries, and nested-pointers to perform computational analyses
4. Understand the basics of coding to solve coupled equations