

Computational Methods for Atmospheric Science, ATS607

Colorado State University

Department of Atmospheric Science, Spring 2019

Tuesdays and Thursdays @ 10:45 – 12:00

Room: A room in ATS or ENGR Research Center (ERC) “Electronic Classroom” (A210)

Instructor: Dr. Jeffrey Pierce (jeffrey.pierce@colostate.edu), ATS 220
<http://pierce.atmos.colostate.edu>

Office hours: During the lab classes or by appointment.

Teaching assistant: Ali Akherati (alia@rams.colostate.edu)

Prerequisites: none

Class Website: Canvas for ATS607 (<http://info.canvas.colostate.edu/>)

Textbooks (**not required**): Giordano and Nakanishi, Computational Physics, 2nd Edition

Grading: Homework 50%
Midterm test 20%
Final project 25%
Participation 5%

Homework: There will be an assignment every 1-2 weeks. I will generally give 1 class period in the computer lab for you to work on homework while Ali and I are around. Late homework assignments will not be accepted, but I will drop the assignment with the lowest score.

Midterm: The midterm will be given during a class period and will be done on the lab computers.

Final project: There will be a final project to incorporate many elements of the class. The project is fairly open ended. You to base your project on your research, another atmospheric science topic that you are interested in, or you may choose from some suggestions that I can provide upon request.

Objective: To teach the Atmospheric Science graduate students the basics of computer programming, plotting, file input/output, and numerical-method techniques to enhance their research projects.

Operating System: Linux on the ENGR servers in class (you may connect from your office or home too). I will give instructions on how to install Python onto Linux, Mac and Windows for if you wish to install on your own computers.

Computer Language: Python

Topics likely to be covered (not necessarily in this order):

Basic syntax

Plotting

File input/output (text, Excel, NetCDF)

Plotting over maps

Differential equations

Chaos

Stochastic forecast probability estimation

Root finding

Optimization

Basic statistics

Fast Fourier Transforms

CLASS POLICIES

UNIVERSITY POLICIES: Students are expected to follow the CSU Student Honor Pledge (<http://tilt.colostate.edu/integrity/honorpledge/>). This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog (<http://www.catalog.colostate.edu/FrontPDF/1.6POLICIES1112f.pdf>) and the Student Conduct Code (<http://www.conflictresolution.colostate.edu/conduct-code>). At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.

POLICY ON COLLABORATION: Students are encouraged to discuss homework assignments. However, each student must complete their own assignment. If I determine that students are simply copying assignments, I will pursue action through the Office of Academic Integrity (<http://tilt.colostate.edu/integrity/>). Any copying on tests will be similarly not tolerated.

POLICY ON LATE HOMEWORK ASSIGNMENTS: Late homework assignments will not be accepted, but I will drop the assignment with the lowest score.

POLICY ON REMARKING TESTS AND HOMEWORK: Students who disagree with how their assignment, test, or project has been marked should resubmit their work with a written explanation of their concern. The work will be re-evaluated by the instructor in its entirety.

POLICY ON MISSED TESTS: Alternative arrangements for completing missed tests will be made given the submission of appropriate documentation.