

11:670:212 Computational Methods for Meteorology  
Course Syllabus  
Spring 2018

<u>Instructors:</u>	Dr. Enrique N. Curchitser ENR 350 enrique@esm.rutgers.edu (848) 932-7889 Office Hours: By Appt.	Dr. Steven G. Decker ENR 227 decker@envsci.rutgers.edu (848) 932-5750 Office Hours: W 1:30–3
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Textbooks: Required- *Learning Scientific Programming with Python*, by C. Hill (**H**)  
Supplemental- *A Hands-On Introduction to Using Python in the Atmospheric and Oceanic Sciences*, by J. W.-B. Lin (PDF on Sakai)

Learning Goals

Upon completion of this class, students will be able to:

1. Communicate clearly orally and in writing, including by electronic means.
2. Apply the mathematical and physical foundations of meteorology and climatology to solve problems using analytical and computational methods.

<u>Grading:</u>	In-Class Exercises	10%	
	Homework	40%	
	Midterm Exam	20%	(Thursday, March 8)
	Final Project	30%	

Assignments:

Programming practice is an essential part of the class. Most Mondays will involve short in-class exercises. Some of these will be pop-quiz style, held at the beginning of class. *Make sure you have read the weekly reading prior to coming to class each Monday!* You may even want to try typing along with the textbook. Ten homework assignments will be given, each worth 4% of your grade. These assignments will be announced on Mondays and always due Friday night/Saturday morning. Additionally, one class period will be devoted to an in-class, open-book midterm exam in which you will solve programming problems similar to those assigned as part of your homework. The course culminates in a final project, to be submitted via Sakai no later than May 2, in which you will carry out a small research project that involves the computational tools learned in this class. The instructors will provide suggestions, or you may choose your own.

## Schedule

Date	Subject	Reading
1/18	Course overview; Introduction to Linux	H 1
1/22	Variables and Logic	H 2.1–2.2
1/25		
1/29	Strings	H 2.3
2/1		
2/5	Lists and Loops	H 2.4
2/8		
2/12	Controlling the Flow of Your Program	H 2.5
2/15		
2/19	I/O; Working with netCDF Data	H 2.6
2/22		
2/26	Functions	H 2.7
3/1		
3/5	Simple Plots	H 3
3/8	<b>Midterm Exam</b>	
3/19	Dealing with Errors and Using Dictionaries	H 4.1–4.2
3/22		
3/26	Arrays with NumPy	H 6.1–6.3
3/29		
4/2	More Complicated Plots	H 7
4/5		
4/9	MetPy	
4/12		
4/16	Work on Final Projects	
4/19		
4/23		
4/26		
4/30		
5/2	Final Projects Due (no final exam)	

Although we will not have a formal assignment on Chapter 5, you may find IPython and the IPython Notebook (renamed the Jupyter Notebook since this textbook was published) useful over the course of the semester, so we encourage you to examine that chapter from time to time on your own.