11:670:212 Computational Methods for Meteorology
Course Syllabus
Spring 2017

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Textbooks: Required*- *A Primer on Scientific Programming with Python*, Fifth Edition, by H. P. Langtangen (**L**)

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.

Grading:			
	Homework	50%	
	Midterm Exam	20%	(Thursday, March 9)
	Final Project	30%	

Assignments:

Programming practice is an essential part of the class. Ten homework assignments will be given, each worth 5% of your grade. 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 3, 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.

* The Langtangen textbook is available as a PDF through SpringerLink.

Schedule

Date	Subject	Reading
1/19	Course overview; Introduction to Linux	
1/23	Introduction to the Programming Environment	
1/26*	Introduction to Python and the IPython Interpreter	**L** 1
1/30	Python: Loops and lists	**L** 2
2/2*		
2/6	Python: Functions and branching	**L** 3
2/9*		
2/13		
2/16*	Python: Dictionaries and Strings	**L** 6
2/20	Python: Arrays	**L** 5.1–5.2, 5.5–5.9
2/23*		
2/27	Python: I/O; Working with netCDF Data	**L** 4
3/2*		
3/6		
3/9	**Midterm Exam**	
3/20 3/23*	Python: Plotting	**L** 5.3–5.4, 5.10–5.11
3/27 3/30*	Python: Introduction to Classes	**L** 7
4/3 4/6*	Python: Working with GEMPAK Data	
4/10* 4/13	Putting it all together: Plotting CAPE from model data	
4/17 4/20 4/24 4/27 5/1	Work on Final Projects	
5/3	Final Projects Due (no final exam)	