

# Cover Sheet: Request 14653

## Pragmatic Python for Weather

### Info

Process	Course New Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Stephen Mullens <a href="mailto:stephen.mullens@ufl.edu">stephen.mullens@ufl.edu</a>
Created	1/28/2020 11:02:34 AM
Updated	4/3/2020 9:01:05 AM
Description of request	This is a new course to accompany a new meteorological major. Other core courses teach the theories associated with meteorology. This course teaches and applies computer programming skills for students to work with raw meteorological data.

### Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CLAS - Geography 011609000	Jane Southworth		2/3/2020
No document changes					
College	Recycled	CLAS - College of Liberal Arts and Sciences	Joseph Spillane	The College Curriculum Committee recycles this request, with the following changes needed: 1) please add a grading scale; 2) offer more detail on the grading scheme	2/17/2020
No document changes					
Department	Approved	CLAS - Geography 011609000	Jane Southworth		2/25/2020
No document changes					
College	Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane		4/3/2020
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			4/3/2020
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

## Course|New for request 14653

### Info

**Request:** Pragmatic Python for Weather

**Description of request:** This is a new course to accompany a new meteorological major. Other core courses teach the theories associated with meteorology. This course teaches and applies computer programming skills for students to work with raw meteorological data.

**Submitter:** Stephen Mullens stephen.mullens@ufl.edu

**Created:** 2/19/2020 9:57:41 AM

**Form version:** 7

### Responses

**Recommended Prefix** MET

**Course Level** 3

**Course Number** XXX

**Category of Instruction** Intermediate

**Lab Code** None

**Course Title** Pragmatic Python for Weather

**Transcript Title** Python for Weather

**Degree Type** Baccalaureate

**Delivery Method(s)** On-Campus

**Co-Listing** No

**Effective Term** Earliest Available

**Effective Year** Earliest Available

**Rotating Topic?** No

**Repeatable Credit?** No

**Amount of Credit** 3

**S/U Only?** No

**Contact Type** Regularly Scheduled

**Weekly Contact Hours** 3

**Course Description** Provides a fundamental understanding of the Python programming language with a core focus on ingesting, displaying, and analyzing observational meteorological data and numerical weather model data.

**Prerequisites** MET1010 or GEO2242

**Co-requisites** MET3573

**Rationale and Placement in Curriculum** Other courses will teach students to analyze meteorological data. There needs to be a course where students can learn programming skills that work with the raw data they will encounter in any meteorological career. Computer programming is not only a near-required job skill, but it enables students to use incoming data wisely in their career.

**Course Objectives** • Understand what a computer program does and how they're useful aids in the real world.

- Set up a development environment using Visual Studio Code and Anaconda Navigator.
- Apply python principles – variables, conditionals, data structures, primitives, functions – to ingest, manipulate, and display data.
- Ingest meteorological data from an Application Program Interfaces (APIs).
- Create maps of meteorological data from official sources (e.g. National Weather Service, National Hurricane Center, and Storm Prediction Center).
- Display time-series of weather data from buoys.
- Display upper air information from data acquired by weather balloons.
- Ingest and display remotely-sensed data (radar and satellite).

**Course Textbook(s) and/or Other Assigned Reading** Python for Everybody, Dr. Charles Severance  
A Hands-On Introduction to Using Python in the Atmospheric and Oceanic Sciences, Dr. Johnny Lin

- Weekly Schedule of Topics**
- 1: Introduction to the course, why programs are useful, how programs written and executed, setting up your integrated development environment (IDE).
  - 2: Using Python's language of variables, strings, math operations, and conditionals to build a meteorological unit conversion calculator.
  - 3: Ingest weather data from a web API, put the data into python's data structures, and parse the data.
  - 4: Build a program that ingests weather forecast data from official sources, parse the data to display forecasts for selected cities.
  - 5: Use python's mapping and geocoding functions to create maps.
  - 6: Build a program that ingests polygon data from official sources and plot the data onto maps. (e.g. SPC Storm Outlooks, NHC Hurricane Cones)
  - 7: Build a program that ingests point data from official sources and plot the data onto maps. (e.g. SPC Local Storm Reports, NHC Cone points)
  - 8: Enhance plots using data visualization best practices: titles, axes, labels, legends, borders, captions, etc. Use data files from official sources.
  - 9: Plot upper air observational data, including the Skew-T chart, using MetPy and Pandas data structures.
  - 10: Create time series plots of observational data. (e.g., buoy and surface METAR observations)
  - 11: Ingest remote sensing observations (radar and satellite) and plot non-cartesian data on a map.
  - 12: Ingest GRIB2 and NetCDF binary data from NOMADS servers into python data structures to parse and display numerical weather models data on a map.
  - 13: Work on Final Project with instructor present.
  - 14: Work on Final Project with instructor present.
  - 15: Work on Final Project with instructor present.

**Grading Scheme** Project 1 - 10% - make a forecast for cities

Project 2 - 10% - map polygon & point data

Project 3 - 10% - enhance plots

Project 4 - 10% - map upper air data

Project 5 - 10% - plot time series

Project 6 - 10% - plot remote sensing data

Project 7 - 10% - plot model data

Final Project - 30%

A	93.0-100
A-	90.0-92.9
B+	87.0-89.9
B	83.0-86.9
B-	80.0-82.9
C+	77.0-79.9
C	73.0-76.9
C-	70.0-72.9
D+	67.0-69.9
D	63.0-66.9
D-	60.0-62.9
E	0.0-59.9

**Instructor(s)** To be determined.

**Attendance & Make-up** Yes

**Accomodations** Yes

**UF Grading Policies for assigning Grade Points** Yes

**Course Evaluation Policy** Yes