

# ATM 240 - Python programming

Fall 2022 Class # 7908

*Version of 21 August 2022; please check for updates*

**Instructor:** Prof. Robert Fovell

**E-mail:** rfovell@albany.edu

**Zoom:** <https://albany.zoom.us/my/rfovell> (by prior arrangement)

**Office:** 404 ETEC Building

**Office phone:** 518-442-4479

**Office hours:** Whenever I am in my office, or by appointment

**Course page:** <http://www.atmos.albany.edu/facstaff/rfovell/ATM240/index.html>

**Credit:** 1 hour

**Corequisite:** ATM 210 or permission of instructor

**Class meetings:** Tuesday 3-5 PM in ETEC 482

**Required text:** *A Hands-On Introduction to Using Python in the Atmospheric and Oceanic Sciences*, by Johnny Wei-Bing Lin (PDF available on course page)

**Overview:** This is a hands-on laboratory course in programming for atmospheric and environmental science applications, using earth science examples and the Python language. The course is targeted to students with no prior programming experience but will also be useful for those with some background in Python and/or programming. The student will learn to write Python programs to access, manipulate, and display observation and simulation data. The course will cover the basics of the Python language, how to access data from local and remote sources, how to store and manipulate data in arrays and lists, how to write functions and loops, and how to visualize data. Examples will be drawn from atmospheric and environmental sciences.

**Grading (A-E):** Labs and participation (100%).

**General course outline** (subject to modification):

Date	Class number	Topic	Chapter
8/23	1	Introduction and orientation	—
8/30	2	Basics I	Ch. 3
9/6	3	Basics II	Ch. 3
9/13	4	Plotting meteorological data	Ch. 4
9/20	5	Plotting meteorological data	Ch. 4
9/27	6	Plotting meteorological data	—
10/4	7	Xarray I	—
10/18	8	Xarray II	—
10/25	9	Map making with Cartopy	—
11/1	10	Atmospheric soundings	—
11/8	11	Radar data	—
11/15	12	GRIB data and Cartopy	—
11/22	13	GRIB data: application	—
11/29	14	Lorenz equations	—

**Blackboard:** Will be used primarily to host the class lecture Zoom links and past recordings, although that is subject to change. Copies of handouts and assignments will always be available on the course page.

**Late policy:** Late homework and off-time exams are only allowed for University-recognized reasons.

**Absences:** Class attendance is expected and is especially crucial in a laboratory-type course. Unavoidable, anticipated absences – including absences for religious observances – should be discussed with the instructor in advance, and arrangements should be made to make up missing work. For information on medically necessary absences, refer to [http://www.albany.edu/health\\_center/medicaexcuse.shtml](http://www.albany.edu/health_center/medicaexcuse.shtml). Information regarding absences due to religious observance may be found here: <https://www.nysenate.gov/legislation/laws/EDN/224-A>.

**Academic integrity:** Students are responsible for doing their own work, and also responsible for being familiar, and complying, with the University's academic integrity standards. Refer to [http://www.albany.edu/undergraduate\\_bulletin/regulations.html](http://www.albany.edu/undergraduate_bulletin/regulations.html) for more information.

**COVID-19 information:** At the University at Albany, supporting the health and safety of all members of our campus community is a top priority. During the COVID-19 pandemic, we are following federal, state, and local public health guidelines, and these guidelines apply to all campus community members across all University spaces. To ensure that each of us has a healthy and safe learning experience within courses that involve in-person contact, all students, faculty members, staff, and visitors are required to adhere to the expectations outlined on the University's COVID-19 website: <https://www.albany.edu/covid-19/planning-fall-2020/health-safety>.

**Psychological health:** If your distress is interfering with your relationships, academic, work, or daily life, confidential support is available to you. Contact Counseling and Psychological Services (CAPS) at 518-442-5800 or [consultation@albany.edu](mailto:consultation@albany.edu) to schedule an appointment with a psychologist. Virtual counseling services are available. The CAPS website ([www.albany.edu/caps/](http://www.albany.edu/caps/)) also contains self-help resources and other valuable information.