

DSA 5021 DATA ANALYTICS APPLIED TO METEOROLOGY
DATA SPRING 2025
Online Course

COURSE DESCRIPTION

This course covers the application of data analytics to meteorology data. We examine the skill of familiar temperature and rainfall probability forecasts. Also, we examine meteorology data that is stored regularly in space and time, so-called gridded data. For example, satellite or forecast data that is stored in a specific latitude-longitude grid, and available at uniform increments in time. We learn to offer animations of such data.

The programming language used in this course will be Python.

COURSE GOALS & LEARNING OBJECTIVES

- To become skillful with Python, especially using ipython notebooks, reading netCDF files, computing with numpy arrays, and plotting with matplotlib
- To learn the basics of assessing forecast value: Skill scores, Contingency Tables, Reliability diagrams, ROC curves, and Relative Value plots.
- To learn the basics of html and Linux needed to display the results at a website on a Linux server

LEARNING MANAGEMENT SYSTEM

<https://canvas.ou.edu/courses/318170>
<http://dsa5021.net>

COURSE MEETING TIME & LOCATION

100% Online course. Self-paced.

PREREQUISITES

Departmental permission. Graduate standing. Ideally, students will already have experience with Python. If not, an accelerated and abbreviated synopsis of an elementary course in Python will be available, designed especially as prerequisite for this course.

REQUIRED TEXTBOOKS

There are no required textbooks. Instructional material is available from the course site, and reference material is freely available from many alternative websites.

COURSE FORMAT

There are no exams. The grade is based on satisfactory completion of 4 projects, and 4 quizzes. The choice of the projects is restricted to these 4:

1. Building and maintaining a simple password-protected website on a Linux server
2. Assessing forecast skill for temperature forecasts. Skill scores, contingency tables.
3. Rainfall probability forecast verification. Reliability diagrams, ROC curves, and Relative Value plots.
4. Analyzing 24 months of monthly-averaged Sea Surface Temperature data, for years 2001 and 2002.
Python skills: reading arrays from netCDF file, analyzing with numpy, plotting with matplotlib.
Climate, anomalies, and annual ranges.

FINAL EXAMS

There is no final exam.

EVALUATION

Students must earn 90% or more of the total points to earn an "A" in this class, 80-89% to earn a "B," 70-79% to earn a "C," and 60-69% to earn a "D."

COURSE POLICIES

1. Late Policy: The first project is due by the third week of class. The remaining 3 projects are due by the last day of class.
2. University policies on scholastic dishonesty will be strictly enforced. University of Oklahoma Honor Council recommends using following pledge when students submit their assignments; "**On my honor, I affirm that I have neither given nor received inappropriate aid in the completion of this exercise**" with name and date. For detailed information, visit OU Honor Council Website at <http://www.ou.edu/honorcouncil/>. This pledge is implicit in all submitted work...

COURSE POLICY ON ACADEMIC HONESTY

The policy regarding academic honesty for this course consists of the definitions and policies as stated in the OU Faculty Handbook (October, 1998): "Honesty is a fundamental precept in all academic activities, and those privileged to be members of the university community have a special obligation to observe the highest standards of honesty and have the right to expect the same standards of all others." Academic misconduct includes, but is not limited to, cheating, plagiarism, fabrication and fraud.

AMERICANS WITH DISABILITY STATEMENT

Students requiring academic accommodation should contact the Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information please see the Disability Resource Center website <http://www.ou.edu/drc/home.html>. Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

RELIGIOUS OBSERVANCE

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty.

TITLE IX RESOURCES AND REPORTING REQUIREMENT

For any concerns regarding gender-based discrimination, sexual harassment, sexual assault, dating/domestic violence, or stalking, the University offers a variety of resources. To learn more or to report an incident, please contact the Sexual Misconduct Office at 405/325-2215 (8 to 5, M-F) or smo@ou.edu. Incidents can also be reported confidentially to OU Advocates at 405/615-0013 (phones are answered 24 hours a day, 7 days a week). Also, please be advised that a professor/GA/TA is required to report instances of sexual harassment, sexual assault, or discrimination to the Sexual Misconduct Office. Inquiries regarding non-discrimination policies may be directed to: Bobby J. Mason, University Equal Opportunity Officer and Title IX Coordinator at 405/325-3546 or bjm@ou.edu. For more information, visit <http://www.ou.edu/eoo.html>.

ADJUSTMENTS FOR PREGNANCY/CHILDBIRTH RELATED ISSUES

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your professor or the Disability Resource Center at 405/325-3852 as soon as possible. Also, see <http://www.ou.edu/eoo/faqs/pregnancy-faqs.html> for answers to commonly asked questions.

DIVERSITY POLICY

The School of Meteorology complies with national accrediting standards designed to help prepare students to understand and relate to issues of interest to women and people of color in a multicultural, multi-ethnic and otherwise globally diverse world.

DISCLAIMER

The course may change based on the speed that a given class can advance or on the judgment of the instructor that an alternate method may either allow learning at the current or at an advanced rate.

INSTRUCTOR

Brian Fiedler, Ph. D. Professor Emeritus of Meteorology

E-mail: metrprof@gmail.com

Office hours: send me an email, and let's see if we can work it out.