Programming for Applied Data Science
EGN 5442
Class Periods: M| Period 7-8 (1:55 PM-3:50 PM)
W| Period 7 (1:55 PM-2:45 PM)
Location: CSE E118
Academic Term: Fall 2024

Instructor
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Office Location: 515 Weil Hall
Office Hours: T 11:30AM-1:30PM, or by appointment

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
TBA on Canvas

Course Description
EGN 5442 Programming for Applied Data Science   3 Credits

Grading Scheme: Letter Grade
Concepts used to skillfully apply and create new Data Science algorithms using a high-level language such as Python.

Course Pre-Requisites / Co-Requisites
Previous experience with computer programming is strongly encouraged.

Course Objectives
After completing this course, students should understand: (1) Structure and control flow of computer programs, (2) data types and data structures, and (3) Methods for accessing databases and other data files, (4) and processing large data sets. Examples with real data sets will be provided throughout. Tests will require answering standard questions and writing parts of programs.

Materials and Supply Fees
None.

Required Textbooks and Software (assuming Python 3.X is the programming language)
- Wes McKinney (2022), Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Jupyter (3rd Edition), O'Reilly, ISBN-13: 978-1098104030, ISBN-10: 109810403X, https://wesmckinney.com/book/

Software: Jupyter Notebook, VS Code, Google Colab

Recommended Materials
- Scott McCoy (2024), Murach's Python for Data Science (2nd Edition), Mike Murach and Associates Inc., ISBN 978-1-943873-17-3, https://www.murach.com/shop/murach-s-python-for-data-science-2nd-edition-detail
- Joel Grus (2019), Data Science from Scratch: First Principles with Python (2nd Edition).
- Leskovec, J., Rajaraman, A., & Ullman, J. (2019). Mining of massive datasets (3rd ed.). Cambridge, United Kingdom: Cambridge University Press. Retrieved from http://www.mmds.org/
- Jake VanderPlas, Python for Data Science Handbook: Essential Tools for Working with Data (2nd Edition), O'Reilly, ISBN-13: 978-1098121228, ISBN-10: 1098121228
- Zybook, Data Science Foundations with Python: https://www.zybooks.com/catalog/data-science-foundations-python/

Required Computer
UF student computing requirement: *https://news.it.ufl.edu/education/student-computing-requirements-for-uf/*

Course Schedule (assuming Python 3.X is the programming language)

Week 01 (Aug 26-): Course Overview, Preliminaries [Ch1], Python Basics [Ch2]
Week 02 (Sep 02-): Python Basics: Semantics, Scalar Types, Control Flow [Ch2]
Week 03 (Sep 09-): Python Data Structures and Sequences: list, tuple, set, dictionary [Ch3]
Week 04 (Sep 16-): Python Functions and Modules [Ch3], NumPy Basics [Ch4]
Week 05 (Sep 23-): Getting Started with pandas [Ch5]
Week 06 (Sep 30-): Plotting and Visualization [Ch9]
Week 07 (Oct 07-): Data Cleaning and Preparation [Ch7]
Week 08 (Oct 14-): Data Wrangling: Join, Combine, and Reshape [Ch8]
Week 09 (Oct 21-): Supplementary Files [Ch6] [Ch10] /**Midterm Exam**
Week 10 (Oct 28-): Defining classes, scikit-learn (regression) [Ch12]
Week 11 (Nov 04-): Object-oriented programming (OOP), scikit-learn (classification)
Week 12 (Nov 11-): PyTorch: Neural Networks, Deep Learning basics
Week 13 (Nov 18-): Get and load Data [Ch6], Github, Project Progress
Week 14 (Nov 25-): *Thanksgiving Break*
Week 15 (Dec 02-): Term Project Presentation, Wrap-up

Attendance Policy, Class Expectations, and Make-Up Policy

Regular attendance with a personal laptop is REQUIRED. Excused absences are consistent with university policies in the Graduate Catalog (https://catalog.ufl.edu/graduate/regulations) and require appropriate documentation. Additional information can be found here: https://gradcatalog.ufl.edu/graduate/regulations/

Evaluation of Grades

Assignment	Percentage of Final Grade
Weekly Coding Exercises	10%
In-Class Programming (ICP)	30%
Mini-Projects	20%
Mid-Term Exam	20%
Term Project	20%
	100%

Grading Policy

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
UF Graduate Catalog
Grades and Grading Policies

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is

important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

In-Class Recording
Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Coordinator
• HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
• Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

Health and Wellness

> **U Matter, We Care:**
> Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.
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> **Counseling and Wellness Center:** https://counseling.ufl.edu, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
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> **Sexual Discrimination, Harassment, Assault, or Violence**
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> If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu
>
> **Sexual Assault Recovery Services (SARS)**
> Student Health Care Center, 392-1161.
>
> **University Police Department** at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

> **E-learning technical support**, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.
>
> **Career Connections Center**, Reitz Union, 392-1601. Career assistance and counseling; https://career.ufl.edu.
>
> **Library Support**, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.
>
> **Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.
>
> **Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.
>
> **Student Complaints Campus**: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.
>
> **On-Line Students Complaints:** https://distance.ufl.edu/getting-help/; https://distance.ufl.edu/state-authorization-status/#student-complaint