

Introduction to Data Analytics
EIN6905 Sections 16G4 & 16GH
Class Periods: MWF, Period 9, 4:05 PM - 4:55 PM
Location: Online
Academic Term: Fall 2020

Instructor

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Virtual Office Hours: Monday and Wednesday, 10:00-11:00 am, or by appointment

Course Description

This course provides a basic understanding of the skills necessary for managing and analyzing data. The concepts that will be covered in this class include exploratory data analysis, data manipulation, data cleaning, data wrangling, and machine learning models. We also provide a basic understanding of data management with SQL. All the technical skills will be motivated by different examples involving data. Python is the programming language that will be used in this class (3 credits).

Course Pre-Requisites / Co-Requisites

Python basics, COP2271, and STA4322 with a minimum grade of C.

Course Objectives

At the end of this course, students will be able to:

- Prepare data for analysis
- Pose correct and relevant questions in the presence of large-scale datasets
- Conduct exploratory data analysis
- Find patterns in large-scale datasets
- Develop hands-on experience utilizing Python and SQL to manage data and apply proper models

Materials and Supply Fees

None

Required Textbooks and Software

- No textbook required
- Lecture notes (posted online in Canvas)
- Videos (posted online in Canvas)
- Jupyter Notebook

Recommended Materials

- Title: Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython
 - Author: Wes McKinney
 - Date and Edition: 2018 2nd Edition
 - ISBN: 9781491957660
- Title: Python Data Science Handbook: Essential Tools for Working with Data
 - Author: Jake VanderPlas
 - Date and Edition: 2017 1st Edition
 - ISBN: 9781491912058
- Title: An Introduction to Statistical Learning: With Applications in R

- Authors: Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani
- Date and Edition: 2013 1st Edition
- ISBN: 9781461471387

Course Schedule

Date	Module	Topics	Assignments (due at 4:00 pm)
8/31	Introduction	Intro to the course	
9/2		What Is Data Analytics?	
9/4		Popular Data Analytics Tools	
9/7		Holiday-No Class	
9/9		Python Data Analytics Libraries	
9/11		Jupyter Installation and Setup	
9/14	Scientific Computing with NumPy	Arrays	Homework 1
9/16		Basic Operations	
9/18		Manipulation	
9/21		Indexing, slicing and iterating	
9/23	Data Manipulation & Analysis	Intro to Pandas	Homework 2
9/25		Data Selection	
9/28		Functions	Forming a team
9/30		Descriptive Statistics Using Pandas	
10/2		Homecoming-No Class	
10/5		Data Cleaning	
10/7		Data Transformation	
10/9		Data Aggregation	
10/12		Exam 1 Review	
10/14		Pivot Tables	Evening Exam
10/16	Exploratory Data Analysis & Visualization	Basic Plots in Matplotlib	
10/19		Customizing Matplotlib Plots	
10/21		Seaborn	Submitting Project Proposal
10/23	Project Proposal	8 minutes each group	
10/26	Machine Learning	Intro to Machine Learning	Homework 3
10/28		Regression	
10/30		Regression	
11/2		Classification	
11/4		Classification	
11/6		Clustering	
11/9		Clustering	
11/11		Holiday-No Class	
11/13	Recommender Systems		
11/16	Recommender Systems		
11/18		Exam 2 Review	
11/20	RDBMS	Introduction	Evening Exam
11/23		Analyzing Data Using SQL	
11/25		Analyzing Data Using SQL	
11/27		Holiday-No Class	
11/30		Advanced SQL Queries	
12/2	Project	Project presentations	Homework 4

12/4	Project presentations	
12/7	Project presentations	
12/9	What's next?	Project submission, project peer assessment

Online Course Recording

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is not required; however, it is strongly recommended. It will be to your benefit to attend all lectures online. Students will be responsible for all material covered in class. If you cannot follow the lecture anymore, you can leave the meeting quietly. Please, remember to silence your cell phone as soon as you join the meeting room. Homework must be submitted by the due date. Students needing a make-up exam due to schedule conflicts must notify the instructor at least one week before the day the exam is scheduled for. You will need to present evidence of the conflict to the instructor. Excused absences must be in compliance with university policies in the Graduate Catalog (<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance>) and require appropriate documentation.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Exam 1	100	20%
Exam 2	100	20%
Homework	100 each	20%
Project	100	35%
Project Peer Assessment	100	5%
		100%

Your grade will be based on two night-exams, 4 homework assignments, and a team project. All assignments must be submitted via E-learning unless specified otherwise. Homework solutions will be posted 2 minutes after the due date.

Exam grade disputes must be made to the instructor within one week after grades are posted. Any grade dispute after the specified period will not be considered. The following describes the procedure:

- (1) Within one week after your grade has been posted, e-mail the instructor requesting a grade breakdown,
- (2) Compare your solution to the solution posted on the website using the detailed grade breakdown you receive,
- (3) If you still have questions about your grade, to resolve the issue either meet the instructor in office hours or request an appointment.

Project: Students are required to work on a data analytics project to practice the skills learned during the class. Projects can be done individually or in a team of maximum of 3 students. You can choose the topic of your choice and answer questions you have about that topic. Project assignments and the due dates are presented in the course schedule section of this syllabus. The final project grades will be the average of instructor assessment and peer assessment based on the rubric. A project rubric will be provided to students for peer-assessment.

Grading Policy

Percent	Grade	Grade Points
90.0 - 100.0	A	4.00
87.0 - 89.9	A-	3.67
84.0 - 86.9	B+	3.33
81.0 - 83.9	B	3.00
78.0 - 80.9	B-	2.67
75.0 - 79.9	C+	2.33
72.0 - 74.9	C	2.00
69.0 - 71.9	C-	1.67
66.0 - 68.9	D+	1.33
63.0 - 65.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

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.ua.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.ua.ufl.edu/public-results/>.

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/policies/student-honor-code-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 Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu

- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.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.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

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 Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.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://care.dso.ufl.edu>.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.