ISM 4641: Python for Business Analytics

CRN: 24739, Section: 901, Credit Hours: 3

COURSE SYLLABUS

Semester	Spring 2023
Class Meeting Days	M
Class Meeting Time	06:30 PM – 09:15 PM
Class Meeting Location	BSN 1102
Instructor	Arindam Ray
Office Location	CIS 2046
Office Hours	M 05:00 PM – 06:00 pm
Email	arindamray@usf.edu

I.   Welcome!

Python for Business Analytics, as the name suggests, is a class for learning Python programming language in the context of applications in Business Analytics. Python is one of the most popular languages now, or shall I say most popular, as tracked by https://pypl.github.io/PYPL.html. The course will primarily be divided into three modules –

- Python Basics
- Data Wrangling and Visualization
- Analytical Modeling

II.   University Course Description

Introduction to Programming using Python is a hands-on course using projects, providing in-depth understanding and application of programming, machine learning, and data science.

III.   Course Prerequisites

ISM 3011 with a minimum grade of C-

IV.   Course Format

The course will be delivered as in-class sessions with a combination of lectures and hands-on exercises.

V.   Student Learning Outcomes

Upon completion of this course, students will be able to:

- Understand basic and advanced data types in Python and apply their understanding to import and clean datasets
- Understand various functions of Python and develop customized methods and functions
- Demonstrate knowledge in selecting and developing proper syntaxes and decision structures for the analysis
- Apply their knowledge of programing and data analysis to select, design and train Machine Learning algorithms to solve data-driven business problems.
- Understand the application and purposes of different machine learning techniques (including clustering and classification algorithms), understand the nature of the problem and the required steps for applying the techniques correctly.

- Demonstrate knowledge of making meaningful inferences from analyzed datasets and generated results
- Selecting proper visualization methods and communicating the findings

VI. Required Texts and/or Readings and Course Materials
- Machine Learning with Python Cookbook, Chris Albon, O'Reilly Media, March 2018, ISBN: 9781491989388

VII. Supplementary (Optional) Texts and Materials
- Learning Python, 5th Edition, Mark Lutz, O'Reilly Media, ISBN: 9781449355739
- A Whirlwind Tour of Python, Jake VanderPlas, O'Reilly Media, Inc., ISBN: 9781491964644 (Free to read from https://jakevdp.github.io/WhirlwindTourOfPython/)
- Automate the Boring Stuff with Python, 2nd Edition, Al Sweigart, No Starch Press; ISBN: 9781593279929 (Free to read from https://automatetheboringstuff.com/)
- Python Machine Learning for Beginners, AI Publishing LLC; ISBN: 9781734790153

VIII. Communication

Announcements: Class announcements will be done through Canvas. Please check Canvas regularly for announcements, as well as, for other class materials.

Office Hours: Students with open questions are encouraged to attend office hours at M 05:00 pm – 06:00 pm at CIS 2046. The office hours will be utilized only for questions from the students' side, so in case you do not have any questions, you need not attend the same.

E-mail: In case of any query beyond office hours, you may send your instructor an e-mail directly from your USF e-mail account, please put "[Fall 2022, ISM 4641]" as the opening tag in the title of your email. Your instructor usually responds to your e-mails within 1 business day. Your instructor will send communications through the Canvas system. However, he may also communicate directly to your USF e-mail account. Your instructor expects that you respond to your instructor's e-mails within 1 business day if requested.

IX. Grading Scale

Grading Scale (%)

90-100	A
80 - 89	B
70 - 79	C
60 - 69	D
0 - 59	F

X. Grade Categories and Weights

Assessment	Percent of Final Grade
Assignments (2 Nos – 20% each)	40%
Midterm Exam/Quiz (2 Nos – 15% each)	30%
Final Project (including Video Submission/Presentation)	30%
	100%

XI. Course Schedule

Week	Dates	Topics	Modules
1	01/09/2023	• Instructor and student introduction • Syllabus walkthrough (assignments, projects, expectations, course format) • Introducing Python • Environment set-up • "Hello World!" • Basic Semantics – Variables and Operators	Python Basics
2	01/16/2023	**Dr. Martin Luther King, Jr. holiday, No Class**	
3	01/23/2023	• Control Flow • Data Structures	
4	01/30/2023	• Functions • Modules • Closure of Module 1: Python Basics Assignment 1 (Python Basics)	
5	02/06/2023	• Basic Data operations – Introduction to NumPy • Advanced Data operations – Introduction to Pandas Quiz 1 (Python Basics)	Data Wrangling and Visualization
6	02/13/2023	• Data visualization – Introduction to MatPlotLib • Closure of Module 2: Data Wrangling and Visualization Assignment 2 (Data Wrangling and Visualization)	
7	02/20/2023	• Supervised Learning - Regression Quiz 2 (Data Wrangling and Visualization)	Analytical Modeling
8	02/27/2023	• Supervised Learning – Regression • Supervised Learning – Feature Selection, Data Standardization	
9	03/06/2023	• Supervised Learning – Classification (Logistic Regression)	
10	03/13/2023	**Spring Break. No Class**	
11	03/20/2023	• Supervised Learning – Classification (SVM, KNN)	
11	03/27/2023	• Supervised Learning – Clustering (K-Means)	
12	04/03/2023	• Other Machine Learning algorithms	
13	04/10/2023	Final Project Presentations	
14	04/17/2023	Final Project Presentations	
15	04/24/2023	Final Project Presentations	

* Note: all the dates and assignments are tentative and can be changed at the discretion of the instructor.

XII. USF Core Syllabus Policies

USF has a set of central policies related to student recording class sessions, academic integrity and grievances, student accessibility services, academic disruption, religious observances, academic continuity, food insecurity, and sexual harassment that **apply to all courses at USF**. Be sure to review these online at: https://www.usf.edu/provost/faculty/core-syllabus-policy-statements.aspx

XIII. Course Policies: Grades (include sections as applicable to your course)

Make-Up Policy: Make-up assignments/quizzes will not be given. If a student misses an assignment/quiz, she/he will receive zero credit for the missed one. If a student has to miss an exam under absolute dire emergencies, she/he should notify the instructor as soon as possible and provide proper written documentation (such as a signed letter from a medical professional which excuses the student from any school activities during the open period of assignments/quizzes).

Late Work Policy: Assignments turned in late will be assessed a penalty: 10% for each calendar day of delay. It will not be accepted if overdue by more than three days.
Please note that the final project submission cannot be delayed as the final grades need to be submitted to the University within a given timeframe.
Please do not wait until the last moment for the submission. Excuse of a technology failure will not be accepted as a valid reason and may result in penalty per the late work policy.

Project Assignment Policy: The project assignments need to be completed individually. Each member of the class must submit a project.

Extra Credit Policy: Throughout the semester, depending on the progress rate of the course, in-class exercise(s) might be given for extra credit. Points earned in this manner will not be included in the assignment or exam grade. Extra credit may result in an increase in your final letter grade, especially in borderline situations, and will never reduce your grade. For this reason, you should take full advantage of extra credit opportunities. The extra credit exercises will not be announced in advance, students are expected to attend all the classes to take such opportunities.

XIV. Course Policies: Technology and Media (include sections as applicable to your course)

Canvas: This course will be offered via USF's learning management system (LMS), Canvas. In case of any technical challenges with Canvas, you may contact USF's IT department at (813) 974-1222 or help@usf.edu.

Online Exam Proctoring: The course may use online proctoring for assignments/quizzes. Please see below:

All students must review the syllabus and the requirements, including the online terms and video testing requirements, to determine if they wish to remain in the course. Enrollment in the course is an agreement to abide by and accept all terms. Any student may elect to drop or withdraw from this course before the end of the drop/add period.

Online exams and quizzes within this course may require online proctoring. Therefore, students will be required to have a webcam (USB or internal) with a microphone when taking an exam or quiz. Students understand that this remote recording device is purchased and controlled by

the student and that recordings from any private residence must be done with the permission of any person residing in the residence.

To avoid any concerns in this regard, students should select private spaces for the testing. Students with concerns may discuss location of an appropriate space for the recordings with their instructor or advisor.

Students must ensure that any recordings do not invade any third-party privacy rights and accept all responsibility and liability for violations of any third-party privacy concerns. Students are strictly responsible for ensuring that they take all exams using a reliable computer and high-speed internet connection. Setup information will be provided prior to taking the proctored exam. To use Honorlock, students are required to download and install the **Honorlock Google Chrome extension**. *For additional information please visit the* **USF online proctoring student FAQ** *and* **Honorlock student resources**.

Student-to-Student Communication: While students may use digital communication tools (WhatsApp, GroupMe, etc.) to communicate with fellow students, it is important to remember that academic integrity policies still apply in these environments. Informing others about the contents of tests is prohibited by the official regulation, as is receiving unauthorized information about an examination. Students are expected and required to immediately report instances of such violations to the instructor.

Laptop Usage: As it is a programming language course, all students are expected to have their laptops during class hours to do in-class exercises and take part in quizzes/assignments.

XV.   Course Policies: Student Expectations

Title IX Policy:

Title IX provides federal protections for discrimination based on sex, which includes discrimination based on pregnancy, sexual harassment, and interpersonal violence. In an effort to provide support and equal access, **USF has designated all faculty (TA, Adjunct, etc.) as Responsible Employees, who are required to report any disclosures of sexual harassment, sexual violence, relationship violence or stalking.** The Title IX Office makes every effort, when safe to do so, to reach out and provide resources and accommodations, and to discuss possible options for resolution. Anyone wishing to make a Title IX report or seeking accommodations may do so online, in person, via phone, or email to the Title IX Office. For information about Title IX or for a full list of resources please visit: https://www.usf.edu/title-ix/gethelp/resources.aspx. *If you are unsure what to do, please contact Victim Advocacy – a confidential resource that can review all your options – at 813-974-5756 or va@admin.usf.edu.*

Course Hero / Chegg Policy:

The USF Policy on Academic Integrity specifies that students may not use websites that enable cheating, such as by uploading or downloading material for this purpose. This does apply specifically to Chegg.com and CourseHero.com – almost any use of these websites (including uploading proprietary materials) constitutes a violation of the academic integrity policy.

Professionalism Policy:

Per university policy and classroom etiquette, mobile phones, iPods, etc. **must be silenced** during all classroom lectures.

Please arrive on time for all class meetings not to disturb the class by walking in late.

End of Semester Student Evaluations:

All classes at USF make use of an online system for students to provide feedback to the University regarding the course. These surveys will be made available at the end of the semester, and the University will notify you by email when the response window opens. Your participation is highly encouraged and valued.