ISM 6251:
Data Science Programming
Credit Hours: 3
Muma College of Business,
School of Information Systems and Management

COURSE SYLLABUS

Semester: Spring 2023
Dates: 02/06/23- 05/01/23
Delivery method: Classroom
Location:
Instructor: Dr. Tim Smith
Instructor email: smith515@usf.edu
Virtual Office Hours: Monday 3:30pm-4:30pm (Microsoft Teams)

Minimum Technical Skills & Requirements: This course requires you to learn and use Python. You will be given example code, but you should be able to adapt these to new problems. You will have to install Anaconda distribution on your computer to use Python.

In order to take courses online at USF, you will need to be able to demonstrate proficiency at basic computer skills, maintain reliable internet access, and meet the computer system requirements listed at: https://www.usf.edu/it/remote/requirements-for-students.aspx

Classroom delivery: The course is delivered through live classroom sessions. It is important that you attend these sessions. Classes will not be recorded. If you miss a class, it will be your responsibility to catch up by reviewing the posted material and discussing with your peers any content from the classroom.

I. University Course Description

Data analytics techniques, tools and applications have become mainstream in variety of business, scientific, social and policy applications. This course will provide students with an in-depth overview of machine learning techniques for analytics using Python as the programming language. Students will also learn to apply advanced machine-learning techniques using Python. Students are expected to be familiar with at least one programming language. They will be expected to learn Python independently in the course, as the focus will be on applying machine learning ideas in this platform and not the language itself. Students will be assigned various data camp courses to assist the student in learning the required python and computer skills.

Specific topics will include decision trees, gradient descent methods, support vector machines, dimensionality reduction, neural networks, deep learning, and reinforcement learning. The course will focus on an advanced understanding of these methods and the use of these techniques in Python.

II. Course Prerequisites

None

III. First Week Attendance Policy

You will be required to attend the first class. Students who do not attend the first class will be dropped from the course.

IV. Student Learning Outcomes

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

- Demonstrate understanding of specific machine learning methods
- Describe different ways in which models can be evaluated
- Build and evaluate predictive models using Python
- Analyze a dataset using data analytics methods
- Describe global business scenarios where machine learning can be applied
- Understand version control and collaboration using a version control system (GitHub)

V. Required Text

Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, 2nd Edition by Aurélien Géron
(Can be downloaded as an e-book from USF Library for free)

VI. Grading Scale, Grade Categories, and Weights

Evaluation:	Points	Total	Grading:	
3 Quizzes	**30 points (10 each)**	**30% of the grade**	A+	>=98%
3 Assignments	**30 points (10 each)**	**30% of the grade**	A	>=95%
11 In-class practice	**10 points (+1 extra)**	**10% of the grade + 1%**	A-	>=90%
DataCamp courses	**30 points**	**30% of the grade**	B+	>=85%
Portfolio Submission	**2.5**	**Bonus 2.5% of the grade**	B	>=80%
			B-	>=75%
			C+	>=70%
			C	>=65%
			C-	>=60%
			D	<60%
TOTAL		**103.5%**		

VII. **Supplementary (Optional) Texts and Materials**

Unless otherwise indicated, all materials in Canvas are required.

VIII. **How to Succeed in this Course – Organized as a FAQ:**

- Where is the course schedule?

Please see the last page of this syllabus for course schedule.

- Do I have to buy the textbook?

No. You will be fine if you take good notes and pay attention to the lectures. But, this is one of the best textbooks on machine learning. It is a good source of information in this field. You can also download it from the USF library for free.

- Are there other sources of information I can use?

The topics covered in this course are very popular/contemporary. A simple Google search will return lots of information. But be careful: not all websites provide accurate/academic information.

- Do I have to buy any software programs?

No. All software used in this course is free.

- Is there a recommended operating system for this course?

Linux, MacOS, and Windows 10+. The required software (Anaconda) can be installed on Linux, MacOS and Windows. It cannot be installed in other systems, including Android OS, and IOS.

- How is this class organized?

All course materials are organized using "Modules." Modules will contain lecture slides, assignments, exercises, quizzes, and DataCamp assignments. You will attend class and complete any assignments or quizzes before the deadline in Canvas.

- Are the quizzes timed?

Yes. Please refer to each quiz instruction on Canvas to learn more about quizzes.

- How do I know what is covered in each quiz?

Please refer to each quiz instruction on Canvas. The instructions describe the modules covered in that quiz.

- What types of questions should I expect in quizzes?

Quizzes involve multiple choice, multiple answer, and true/false questions.

- Are quizzes open notes?

Quizzes will use Respondus 'Lockdown' browser, but you will be allowed to refer to paper notes. However, if you rely only on your notes and do not study, you will run out of time before answering all questions. Study and be prepared before taking the quizzes. If you don't study well, you'll likely fail the quizzes.

- What are "assignments"?

Assignments allow you to apply what you learned in modules to a new problem. They are individual work and must be submitted before their deadline (announced in Canvas).

- Can I submit late (or complete any assignment after its due date)?

Late submissions are accepted only within 24 hours of an assignment's due date. All late submissions will be penalized by 50%.

- Can I take a quiz late?

No, quizzes cannot be taken after their due dates – unless you have a documentable excuse such as a doctor's note.

- Can I make submissions through email?

No. You must use the appropriate submission links in Canvas.

- Do technological problems qualify for extensions, late submissions, or retaking quizzes?

No.

- Can I get an extension on a due date because one of the following occurred: my computer did an update and restarted in the middle of a quiz/assignment; my computer broke down; Canvas is not available; power went out; my Internet went out?

No. But you can make a late submission within 24 hours, which has a 50% penalty.

- Can I work with others or get help from somebody else to complete assignments or quizzes?

No. This is considered cheating. Please refer to the Academic Integrity policy of the graduate catalog to see what is considered cheating.

- What happens if I cheat?

You will be subjected to the following punishments:

  - *Level one violation: No credit is given for the assignment. An additional letter grade is deducted from the overall grade.*
  - *Level two violation: Failing grade for the course ("F") is assigned.*
  - *Level three violation: Failing grade for the course ("FF") is assigned. Suspension for one semester.*

- *Level four violation: Failing grade for the course ("FF") is assigned. Dismissal from the university.*

(Please see the graduate catalog for the definitions of these violations. Note that most cheating falls under levels two and three.)

- I sent an email after 6 pm; why didn't I get a response; what should I do?

I may not be able to answer emails after 6 pm. If it is the day of submission, please try your best and submit.

- Are there any other recommendations you can make for this course?

Please don't procrastinate or leave things to the last minute in this course. It will do nothing but hurt your grade. There are so many things that can go wrong – especially when dealing with programming.

IX. Instructor Feedback Policy & Grade Dissemination

- Email response: Students can expect to receive a response to their email inquiries within 24 hours – unless there are unexpected circumstances. I may not be able to respond to email inquiries after 6 pm. Please don't wait till the last minute; get help early.
- Grading & Feedback: Students can expect to see their grades for assignments/exams and receive feedback within five business days – unless there are unexpected circumstances.

X. Standard University Policies

Policies about disability access, religious observances, academic grievances, academic integrity and misconduct, academic continuity, food insecurity, and sexual harassment are governed by a central set of policies that apply to all classes at USF. These may be accessed on the USF Core Syllabus Policy Statements page at https://www.usf.edu/provost/faculty/core-syllabus-policy-statements.aspx.

XI. Course Policies:

Late Work Policy

Any assignment, quiz, project, etc. turned in late will be assessed a penalty: 50% of the grade if it is one day late. This does not apply to DataCamp courses. DataCamp courses must be completed before the deadline to receive any marks.

Grades of "Incomplete"

An Incomplete grade ("I") is exceptional and granted at the instructor's discretion only when students cannot complete course requirements due to illness or other circumstances beyond their control. The course instructor and student must complete and sign the "I" Grade Contract Form that describes the work to be completed, the

date it is due, and the grade the student would earn factoring in a zero for all incomplete assignments. The due date can be negotiated and extended by student/instructor as long as it does not exceed two semesters for undergraduate courses and one semester for graduate courses from the original date grades were due for that course. An "I" grade not cleared within the two semesters for undergraduate courses and one semester for graduate courses (including summer semester) will revert to the grade noted on the contract.

XII. Course Policies: Technology and Media

Online Proctoring

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. Any online exams or online quizzes offered during this course require online proctoring. Therefore, students must 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 in residence. To avoid any concerns, students should select private spaces for testing. The University library and other academic sites at the University offer secure private settings for recordings, and students with concerns may discuss the location of an appropriate space for the recordings with their instructor or advisor. Students must ensure that recordings do not invade any third-party privacy rights and accept all responsibility and liability for violations of any third-party privacy concerns. Setup information will be provided before taking the proctored exam. For additional information about online proctoring, you can visit the online proctoring student FAQ at this link.

XIII. Course Policies: Student Expectations

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 – any use of these websites (including uploading proprietary materials) constitutes a violation of the academic integrity policy.

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.

Netiquette Guidelines

1. Act professionally in the way you communicate. Treat your instructors and peers with respect the same way you would in a face-to-face environment. Respect other people's ideas and be constructive when explaining your views about points you may disagree with.
2. Be sensitive. Be respectful and sensitive when sharing your ideas and opinions. There will be people in your class with different linguistic backgrounds, political and religious beliefs, or other general differences.
3. Proofread and check your spelling. Doing this before sending an email or posting a thread on a discussion board will allow you to make sure your message is clear and thoughtful. Avoid using all capital letters, it can be perceived as if you are shouting, and it is more difficult to read.
4. Keep your communications focused and stay on topic. Complete your ideas before changing the subject. By keeping the message on focus, you allow the readers to get your idea or answers they are looking for easily.
5. Be clear with your message. Avoid using humor or sarcasm. Since people can't see your expressions or hear your tone of voice, your meaning can be misinterpreted.

Email and Discussion Board Guidelines

1. Use the subject line effectively by effectively communicating what your email or discussion is about.
2. You must include your course and section in the subject for any email to the profession.
3. Keep your emails and postings related to the course content. You should not post anything personal on a discussion board unless the instructor requests.
4. Any personal, course, or confidential issues should be directly communicated to the instructor via email. The discussion boards are public spaces; therefore, any issues should not be posted there.

XIV. Learning Support and Campus Offices

Academic Accommodations

Students with disabilities are responsible for registering with Student Accessibility Services (SAS) in order to receive academic accommodations. For additional information about academic accommodations and resources, you can visit the SAS website.
SAS website for the Tampa and Sarasota-Manatee campuses.
SAS website for the St. Pete campus.

Academic Support Services

The USF Office of Student Success coordinates and promotes university-wide efforts to enhance undergraduate and graduate student success. For a comprehensive list of academic support services available to all USF students, please visit the Office of Student Success website.
Office of Student Success website for the Tampa campus.
Office of Student Success website for the St. Pete campus.
Office of Student Success website for the Sarasota-Manatee campus.

Canvas Technical Support
If you have technical difficulties in Canvas, you can find access to the Canvas guides and video resources in the "Canvas Help" page on the homepage of your Canvas course. You can also contact the help desk by calling 813-974-1222 in Tampa or emailing help@usf.edu.
IT website for the Tampa campus.
IT website for the St. Pete campus.
IT website for the Sarasota-Manatee campus.

Center for Victim Advocacy
The Center for Victim Advocacy empowers survivors of crime, violence, or abuse by promoting the restoration of decision making, by advocating for their rights, and by offering support and resources. Contact information is available online.
Center for Victim Advocacy website for the Tampa campus.
Center for Victim Advocacy website for the St. Pete campus.
Center for Victim Advocacy website for the Sarasota-Manatee campus.

Counseling Center
The Counseling Center promotes the wellbeing of the campus community by providing culturally sensitive counseling, consultation, prevention, and training that enhances student academic and personal success. Contact information is available online.
Counseling Center website for the Tampa campus.
Counseling Center website for the St. Pete campus.
Counseling Center website for the Sarasota-Manatee campus.

Tutoring
The Tutoring Hub offers free tutoring in several subjects to USF undergraduates. Appointments are recommended, but not required. For more information, email asctampa@usf.edu.
Tutoring website for the Tampa campus.
Tutoring website for the St. Pete campus.
Tutoring website for the Sarasota-Manatee campus.

Writing Studio
The Writing Studio is a free resource for USF undergraduate and graduate

students. At the Writing Studio, a trained writing consultant will work individually with you, at any point in the writing process from brainstorming to editing. Appointments are recommended, but not required. For more information or to make an appointment, email writingstudio@usf.edu.
Writing studio website for the Tampa campus.
Writing studio website for the St. Pete campus.
Writing studio website for the Sarasota-Manatee campus.

(Course schedule is on the next page)

XV. **Course Schedule (subject to revision due to unforeseen circumstances)**

Note: For details on deadline date and time, see Canvas and DataCamp.

Week#	Topic	Deliverables
1	Introduction to course, python and machine learning	Exercise 1 DataCamp – GitHub Concepts
2	Using regression techniques	Exercise 2
3	Support Vector Machines	Exercise 3 DataCamp Python Fundamentals
4	Decision Trees	Exercise 4 Assignment 1 Quiz 1 DataCamp Machine Learning
5	Ensemble Techniques	Exercise 5
6	Text Mining	Exercise 6
7	Neural Networks	Exercise 7 DataCamp Deep Learning
8	Deep Neural Networks	Exercise 8 Assignment 2 Quiz 2
9	Convolutional Neural Networks	Exercise 9
10	Recurrent Neural Networks	Exercise 10
11	Autoencoders	Exercise 11
12	Final class wrap-up	GitHub Portfolio Assignment 3 Quiz 3

(*) These are subject to change. Dates and deliverables will be discussed during the first day.