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

COURSE SYLLABUS

Instructor:	Dr. Tim Smith	*E-Mail:*	smith515@usf.edu
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Term:	Summer 2023	*Dates:*	05/15/23 - 06/27/23
Delivery Method:	Asynchronous Online	*Location:*	Online/Canvas
Minimum Technical Skills & Requirements:	*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 here:* https://www.usf.edu/it/remote/requirements-for-students.aspx		
Virtual Office Hours:	Technology Used: Microsoft Teams Wednesday 11:00 am to 12:00 pm Please notify the instructor 12 hours before if you would attend the office hours		

Minimum Technical Skills & Requirements: This course requires learning and using Python. You will be given example code, but you must understand the material and Python concepts sufficiently to adapt to new problems. To use Python, you must install the Miniconda (preferred) or Anaconda distribution on your computer.

Note on Python: Though there are many YouTube videos and blog posts about various aspects of python, if you're new to Python "you don't know what you don't know"; therefore, it would be best for you to follow a course and/or book that walks you through the concepts behind python programming and syntax. As a USF student, you can access LinkedIN Learning (https://www.usf.edu/hr-training/learning-opportunities/linkedin-learning.aspx). I recommend Python Essential Training (it covers a good subset of fundamental Python, but you can ignore the section on creating Python packages – as you will most likely never create your own packages.)

To take this course at USF, you must be proficient in basic computer skills, maintain reliable internet access, and meet the computer system requirements:

- Operating System
  - Windows 7+, MacOS, or Linux (non-android distribution, i.e. Ubuntu or CentOS)
- RAM/Memory:
  - Minimum 4 gigabytes of memory (8+ GB's preferred, and 16+ GB's ideal)
- Disk

- 50 GB of available disk space

Online delivery: The course is delivered through asynchronous weekly modules. You must do a little every day, as attempting to complete the work within a day or two before the deadline will most certainly negatively affect your performance in this course.

I. University Course Description

Data analytics techniques, tools, and applications have become mainstream in various business, scientific, social, and policy applications. This course will give students 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. Students will be expected to learn Python independently in the course, as the course will focus on applying machine learning ideas using Python, not the language itself. To help students develop foundational Python skills, students will be assigned various data camp courses to assist the student in learning the required Python and computer skills, but

Specific machine-learning topics will include decision trees, gradient descent methods, support vector machines, neural networks, deep learning, recurrent neural networks, and autoencoders.

II. Course Prerequisites

Proficiency with at least one computer programming language (Python preferred).

III. First Week Attendance Policy

You must complete an online attendance quiz before May 17th to confirm your attendance. Students not completing this quiz on time 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
- Manage a Python environment for data analysis.

V. Recommended Text

This book is not required but recommended.

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	Grading:	
Quizzes	**20 points**	A+	>=98%
Exercises	**30 points**	A	>=95%
Practice Assignments	**10 points**	A-	>=90%
Discussion Postings	**10 points**	B+	>=85%
Final Exam	**30 points**	B	>=80%
		B-	>=75%
		C+	>=70%
		C	>=65%
		C-	>=60%
		D	>=50%
		F	<50%
TOTAL			

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 (Minconda or 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 into weekly modules consisting of two major topics. Each weekly module will contain lecture slides, practice assignments, exercises, and quizzes.

- 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?

Each quiz is associated with a part of a weekly module. Quizzes test your retention of the material covered in a module; therefore, it is recommended that you complete all work before attempting the quiz. All quizzes are closed book, and you can not use any assistance to complete the quiz.

- What types of questions should I expect in quizzes?

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

- Are quizzes open notes?

Quizzes are closed note tests of your retention of the material covered in a module section. Quizzes will use the HonorLock browser extension (you must use Chrome). This extension blocks you from switching focus to any other applications. Be sure to study and practice the material 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. These done individually and must be your own work.

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

Late submissions for practice assignments and exercises (only) are accepted with a penalty of 33% per day (one day late = 66% of mark remaining, two days late = 33% of marks remaining, over two days late = 0% of the mark remaining).

- 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. To receive any points, all quizzes must be completed before the deadline – so be sure to begin the quizzes well before the deadline so that you can address any issues.

- Can I make submissions through email?

No. You must use the appropriate submission links in Canvas. If the link is closed on Canvas, submissions are no longer accepted for that assignment.

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

No.

- Can I get an extension on the 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 (with a penalty) for practice assignments and exercises.

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

All work in this course must be done individually.

- 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 5 pm; why didn't I get a response; what should I do?

I may not be able to answer emails after 5 pm. Because of this, you should give yourself plenty of time before a deadline. If it is the day of submission, try your best and submit.

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

Don't procrastinate or leave things to the last minute in this course. It will do nothing but hurt your grade. Many things can go wrong – especially when dealing with programming; therefore, if you do not attempt the work well before the deadline, you will risk an unforeseen issue stopping you from getting full marks due to late penalties or being past the deadline.

IX. Instructor Feedback Policy & Grade Dissemination

- Email response: Students can expect to receive a response to their email inquiries within 24 hours – unless unexpected circumstances exist. I may not be able to respond to email inquiries after 5 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 late exercise or practice assignment will receive a 33% deduction for each day late (total possible after one day late = 66%, total possible after two days late, 33%, more than two days late = 0%. This does not apply to all other course work. Other course work (including quizzes and final exams) must be completed and submitted 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 / ChatGPT Policy

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

End of Semester Student Evaluations

All classes at USF use 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 respectfully like 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	Part1: Introduction to course, python and machine learning Part2: Linear Regression techniques	**For details on all deliverables in a section: see Canvas (these are clearly indicated in a 'Deliverables' Section for weekly part/section. Pay close attention to due dates!**
2	Part 1: Data Preparation & Logistic Regression Part 2: Cost functions and Gradient Descent Regularization	
3	Part 1: Decision Trees Part2: Ensemble Techniques Classification Model evaluation	
4	Part1: Neural Networks Part2: Deep Neural Networks	
5	Part1: Convolutional Neural Networks Part 2: Recurrent Neural Networks	
6	Part 1: Auto Encoders Part 2: Final Exam	

(*) These are subject to change.