



CSCI 333, Applied Data Analytics with Python

COURSE SYLLABUS: Fall 2022

INSTRUCTOR INFORMATION

Instructor	Prof. Eman Hammad	
Office Location	RELLIS ACB2-208	
Office Hours	Wed. 10:30-12:30pm, or by appointment	
Email	eman.hammad at tamuc dot edu (1-2 business days) Email subject MUST contain CSCI333-Fall2022	
Communication Response Time	Within 24 hours on weekdays, but any communication after Friday 5pm will be responded to by the following Monday	

COURSE INFORMATION

Lectures (Time/Location):

- Monday/Wednesday, 9:10 – 10:25 AM. In-person at ACB2-314.

Textbook(s):

- There are NO required textbooks for this course.

Recommended Textbooks, References and Resources:

For the most part, our course slides and material will be sufficient for understanding course topics. The following textbooks and web resources can be useful as references.

- Python Crash Course, 2nd Edition: A Hands-On, Project-Based Introduction to Programming by Eric Matthes
ISBN-10: 1593279280 ISBN-13: 978-1593279288
- Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data and The Cloud by Paul J. Deitel , and Harvey Deitel ISBN-13: 978-0135404676 ISBN-10: 0135404673
- Practice of Computing Using Python, The, Student Value Edition,3rd Edition, by William F. Punch, and Richard Enbody ISBN-13: 978-0134380315 ISBN-10: 0134380312
- Python for Everyone, 2nd Edition by Cay S. Horstmann, Rance D. Nicaise ISBN-13: 978-1119056553 ISBN-10: 1119056551
- Introduction to Machine Learning with Python, *Andreas C. Muller and Sarah Guido, 2016.*
- Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython 2nd Edition by Wes McKinney
ISBN-13: 978-1491957660 ISBN-10: 1491957662
- Python for Software Design: How to Think Like a Computer Scientist 1st Edition by Allen B. Downey (Author). Available at <http://www.greenteapress.com/thinkpython/thinkpython.html> ISBN-13: 978-0521725965 ISBN-10: 0521725968
- Automate the Boring Stuff with Python: Practical programming for total beginners by Al Sweigart. Available at <https://automatetheboringstuff.com/> ISBN-10: 1593275994 ISBN-13: 978-1593275990

Websites:

- Python for beginners: <https://www.python.org/about/gettingstarted/>

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- Learn python: <https://www.learnpython.org/>
- Google's Python Class: <https://developers.google.com/edu/python/>
- The Python Tutorial: <https://docs.python.org/3/tutorial/>
- Tutorialpoint: <https://www.tutorialspoint.com/python/index.htm>
- Google Machine Learning Foundational Courses: <https://developers.google.com/machine-learning/foundational-courses>
- Github repositories: for example <https://github.com/josephmisiti/awesome-machine-learning/blob/master/books.md>
- Kaggle Datasets: <https://www.kaggle.com/datasets?fileType=csv>

Software Required

Students may develop your programs on any machine that you like: we encourage you to use your own equipment. We provide instructions for setting up a Python programming environment under Windows, OS X, and Linux. You can use one of the several excellent Python IDEs available, with instructor materials covering PyCharm and Anaconda that are freely available for academic use and works on the major computing platforms (Windows, OS X, and Linux).

Course Description

This course covers both theoretical and practical aspects of applied data science, analytics, and visualization in Python. We will start from general python programming basics, data structures, and algorithm design with a heavy emphasis on applying data analysis and visualization techniques to solve real-world problems in different domains. Topics include data representation, manipulation and clearing, visualization, regression, convolutional and recurrent neural networks, reinforcement learning, model development and evaluation with most up-to-date Python modules and popular toolkits.

Student Learning Outcomes

Upon completing this course, students will be able to:

- Self-configure various Python programming environment.
- Code, compile, debug, and run Python programs.
- Learn Python language syntax and fundamental programming concepts including variables, control statements, loops, functions, lists, and classes.
- Use modules and tools to collect, reshape, analysis, and visualize data.
- Develop programs for various real-world problems by applying data science.
- Evaluate data results and make optimal decisions.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Prerequisites: COSC 2336

Instructional Methods

During this course, we will using traditional and active learning methods, and work together using:

- In-class lectures: using slides, supplementary materials, and hands-on exercises.

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- Assignments and labs that will be released via the D2L Learning Management Systems (LMS).
- Individual / group projects.

Student Responsibilities or Tips for Success in the Course

It is expected that you are the owner of your success in this course, including ensuring you understand the expectations, timelines, policies and learning objectives.

Baseline expectations:

- Check LMS frequently and remain current with the course content and assignments
- Start your homework assignments early so that you can ask for help if needed.
- Check the feedback on homework assignments.
- Do your own work: you are encouraged to collaborate and consult with classmates to improve your understanding and to develop problem-solving strategies. However, cheating and plagiarism will not be tolerated, i.e. do not copy other people's work.
- Communicate with the instructor when you are confused, or having difficulties with the course material / assignment / project.
- Get help (sooner than later) if you have challenges or problems:
 - Start or join a study group with classmate(s) from the course to compare notes and discuss class content.
- What you get out of any class depends to a very large degree on what you are willing to put into it. Get in the habit of writing little practice programs to try out new language features as we learn them. As you write more programs (even small ones), the process becomes easier, you are much more likely to remember how the language works and to apply it more effectively for data processing.

GRADING & ASSESSMENTS

Final grades in this course will be based on the following scale: A = 90%-100%, B = 80%-89%, C = 70%-79%, D = 60%-69%, F = 59% or below.

Assessment Type	Weight of Final Grade	Learning Objectives
Assignments	20%	Critical understanding and problem solving using course concepts
Labs and Quizzes	20%	
Midterm Exam	15%	
Final Exam	15%	
Project	20%	

Assignments and term project are to be graded considering the following: 1) demonstrating good form; including good organization, remarks and indentation. 2) Submission on time (late submission are subject to the penalty, ref. late submission section). 3) Meeting assignment / report technical requirements.

- Quizzes and exams are graded based on the correctness of the answers and workflow.
- Grades will be posted within one week after assignment due date.
- You are responsible to check your grades after each assignment. You must report any error or inconsistency to the instructor within 5 business days.

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COURSE OUTLINE / CALENDAR

Class meets 8/24/2022- 12/14/2022

➤ **Important dates:**

- Midterm Exam: Wednesday October 19th, 2022.
- Final Exam: Monday December 12th, 2022.

➤ **Tentative calendar**

Week	Topic(s)	Major events
Week 1	Introduction, overview and basics of Python	
Weeks 2, 3	Fundamental Python programming concepts I: syntax and semantics, variables, expressions, assignments, and loops	
Weeks 4, 5	Fundamental Python programming concepts II: functions, fundamental data structures, File I/O, exception handling, algorithms	
Week 6	Python libraries and data collection	
Week 7	Midterm review & exam	Midterm exam
Weeks 8	Data manipulation and visualization	Project assignments
Week 9	Machine learning I	
Week 10	Machine learning II	
Week 11	Machine learning III	
Week 12	Example project study & analysis Thanksgiving break (Nov. 24, 25)	
Week 13	Analysis I and project	
Week 14	Analysis II and project	
Week 15	Project presentations	Project presentations
Week 16	Final review & exam	Final exam

*The schedule is **tentative** and may be adjusted to fit the actual class progress.

Submitting Assignments:

- There will be several assignments, labs, and/or quizzes that are tightly related to the class materials and topics. Submissions are expected to be completed in good quality and by the deadlines.
- Your completed work must be placed in the appropriate dropbox in D2L Online. **DO NOT EMAIL ME ANY ASSIGNMENTS AS THEY WILL BE DELETED.** If you have challenges in accessing D2L temporarily, you can email me your assignment as a proof of on-time submission. **However**, you still need to upload it to the assignment folder as soon the issue is resolved to receive credit.
- You **MUST** check your files before and after uploading them to D2L to ensure they can be open appropriately. In the case that the instructor is not able to open your submission file(s) your submission will not be graded.
- Unless special instructions are provided, **assignments are NOT to be posted on ANY discussion board, online websites or file-sharing platforms.** Please follow the rules for naming and posting assignments.

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- All assignments must be submitted using D2L if applicable. Students must adhere to the following rules when submitting assignments. Failure to do so will affect their grades.
 - **File Name:** Should be named according to the following pattern:
 <LastName>_<FirstName>_AXQY.**, where LastName is the student's last name, FirstName is the student's first name, and X is the assignment number, Y is the question number if there are several questions in the assignment.
 - For example, my assignment3, question 2 Python file submission will be named Hammad_Eman_A3Q2.py for a programming assignment.
 - **File Header:** for programming the first lines of the submitted file should include a comment with the following information and format:

```
#
# A short description of the program.
#
# @author      Last Name, First Name
# @assignment  CSCI 333 Assignment X
# @date       Date
#
```

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeoOnline Learning Management System (LMS). Below are technical requirements

LMS Requirements: <https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support: https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all coursework in a timely and satisfactory manner. Each student is expected to have a backup method to deal with these inevitable problems. In case of extreme technology related circumstances, please communicate directly with the instructor to best manage your success in this course.

COMMUNICATION AND SUPPORT

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here: <https://community.brightspace.com/support/s/contactsupport>

Interaction with Instructor Statement

To communicate with me about this course, kindly use the email address included in this syllabus. During the week, you can generally expect a response to your emails within 1-2 business days. *If you do not receive my response in 2*

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business days, please send a second email to me.

To ensure I get your email and respond within indicated timelines above, please make sure that:

- Your email message is sent from your Texas A&M Commerce student account.
- Your email message includes a descriptive subject with the indicated prefix:

CSCI 333 – Fall 2022 --<CWID>: <descriptive subject>

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

Attendance is required but not graded. Students are expected to do the readings, attend class, and participate in class discussions. Each student is responsible for managing their own time and work-load. Emergency / extreme circumstances causing a student to miss deadlines/exams will need to be supported by official and university approved documentation. [\(check late work and makeup work policies below\)](#).

Positive Learning Environment

Your commitment as a student to learning is evidenced by your enrollment at Texas A &M University-Commerce. "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedure, Conduct).

Sharing Your Work

All work produced by students may be shared by the instructor with the class for purposes of example and training. Such work will be as anonymous as possible. Finally, the instructor may share your work anonymously with future classes or in her own writing and research.

Late Work Policy

All assignments are due at the date and time specified. **Please keep in mind that NO late work will be accepted without penalty.** If an assignment is turned in after the due date, **20% of the grade will be forfeited.** An assignment must be submitted within 24 hours of the due date if you want it graded.

- You have one 24-hour "late day" token that can be used on any of the assignments.
- After you've used your token, assignments will still be accepted up to 24 hours late, but with a 20% penalty (automatically deducted).
- Assignments turned in more than 24 hours late will NOT be reviewed and will not be graded.

Additional extensions on assignments will be granted with appropriate documentation. If you have a problem submitting an assignment on time you should contact me **BEFORE** the deadline.

Makeup Policy

There will be NO makeup exams or quizzes. If you shall miss a quiz/exam because of acceptable extreme circumstances (hospitalization, serious injury, death in the family etc.), you may be offered to choose to receive a grade based on your in-class ranking in the next quiz/exam.

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Collaboration Policy

Students are encouraged to consult with each other, with the instructor, or anyone else about any assignments / project. However, this must be limited to the discussion of the problem and sketching general approaches to a solution. Each student is responsible for submitting their own independent solutions to the assignment / project.

Consulting another student's or group's solution is prohibited, and submitted solutions may not be copied from any source. These and any other form of unacceptable collaboration on assignments constitute **cheating**. If you have any question or doubts about whether some activity would constitute cheating, please feel free to ask.

Academic Integrity

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments / quizzes / exams / labs are to be completed by the individual student unless otherwise specified.

Any student caught cheating will receive a zero on the work they are doing, and subsequent cheating will result in a failing grade and potential academic sanctions.

Basic Tenets of Common Decency

“All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment.” (Student’s Guide Handbook, Policies and Procedures, Conduct.). This means that rude and/or disruptive behavior will not be tolerated.

Disclaimer

This syllabus is meant to provide general guidance of what to expect from this course. The instructor reserves the right to make changes as appropriate based on the progress of the class. All changes made to this syllabus during the semester will be announced. This document has been posted electronically. If you print a copy of it, please be sure to consult the last modified date of the online version to verify that your printed copy is current.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: <https://www.britannica.com/topic/netiquette>

TAMUC Attendance

For more information about the attendance policy please visit the [Attendance](#) webpage and [Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

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<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce, Gee Library- Room 162, Phone (903) 886-5150 or (903) 886-5835, Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: [Office of Student Disability Resources and Services](http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

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