



CSCI 333

Applied Data Analytics with Python

COURSE SYLLABUS: FALL 2024

INSTRUCTOR INFORMATION

Instructor	Michael J. Henry
Office Location	ACB1/106
Office Hours	By request
Email Address	michael.henry@tamuc.edu
Preferred Communication	Email
Response Time	1-2 business days

COURSE INFORMATION

- Credit hours: 3
- Textbook: N/A
- References:
 - Books:
 - 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
 - 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/>
 - Jython: <https://www.jython.org/> • Learnpython: <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>
- Software required: We will be coding using the jupyter environment. You must be able to install python, jupyter, and run those programs (locally) on your computer

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.

Prerequisites: COSC 2336

Supplementary information for the course is available at D2L. Log on with your Access ID for class notes, lecture slides, class announcements, the course syllabus, and other information for the course. You will submit your assignments and project and check grades there too.

Student Learning Outcomes

This course is similar to an exercise class. You learn new concepts and techniques, and then, exercise these new-found skills. At the end of the class, students can

- 1) (SLO333.1) Self configure various Python programming environment.
- 2) (SLO333.2) Code, compile, debug, and run Python programs
- 3) (SLO333.3) Learn Python language syntax and fundamental programming concepts including variables, control statements, loops, functions, lists, and classes
- 4) (SLO333.4) Use modules and tools to collect, reshape, analysis, and visualize data
- 5) (SLO333.5) Develop programs for various real-world problems by applying data science

6) (SLO333.6) Evaluate data results and make optimal decisions

COURSE REQUIREMENTS

- It is expected that you have at least an introductory knowledge of Python
- The course is hosted on D2L, which can be accessed here: <https://leo.tamuc.edu/>
- Student Expectations
 - You will be expected to do your own work. You may collaborate with others to solve difficult problems, but whatever you turn in must be your own.
 - Late work will be accepted, but you will incur a 50% off penalty
 - Please let me know asap if there are any questions about your grades
 - Please use my preferred email address to get ahold of me
- Instructor Expectations
 - I will attempt to grade homeworks as timely as possible, aiming for no later than one week after the assignment is due
 - I do have to travel for my job during the semester; I will let you know when class is cancelled and I will post materials to D2L to cover the missing courses. It is expected that you view those materials

GRADING

The standard metric for grades will be used:

- A = 90 – 100%
- B = 80 – 89%
- C = 70 – 79%
- D = 60 – 69%
- F = 59% and below

Your score will be made up of the following components:

- Assignments 40%
- Exam 1 20%
- Exam 2 20%
- Project 20%

The syllabus and schedule are subject to change as necessary.

COURSE OUTLINE

- Week 1: Intro, Python Overview

- Week 2-3: Programming concepts, Python structures
- Week 4-5: Functions and Data Structures
- Week 6: File I/O, algorithm design
- Week 7: Exam 1
- Week 8: Python libraries and data collection
- Week 9: Scientific computing
- Week 10: Data manipulation and visualization
- Week 11-12: Machine Learning
- Week 13-14: Analysis and Project Work
- Week 15: Exam 2

COURSE POLICIES

Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course. Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism). Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed. In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty

<https://inside.tamuc.edu/aboutus/policiesproceduresstandardsstatements/rulesprocedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

Academic integrity is a fundamental aspect of our learning. There might be AI misuse in this course, particularly plagiarism and unethical behavior. As your instructor, I would like to remind you of the serious consequences of such activities. AI should be used wisely to help produce authentic and original work and promote productivity and creativity. No one wants to witness the misuse of AI.

To address this problem, Turnitin's AI writing detection (<https://www.turnitin.com/products/features/ai-writing-detection>) is enabled automatically in the D2L to detect and prevent plagiarism. It employs sophisticated algorithms to compare written material to a large database of sources to find similarities or copied content. It is critical to understand that these tools are not intended to invade your privacy or undermine your creativity, but rather to ensure that you are producing unique and real content.

University's academic integrity policy is available at <https://www.tamuc.edu/college-ofbusiness/integrity-policy/> . It is our shared responsibility to encourage a culture of academic integrity and prevent AI abuse.

There are numerous resources available relating to academic plagiarism. Please check them all to build a better understanding of academic plagiarism and avoid academic plagiarism in writing.

[1] The Plagiarism Spectrum. <https://www.turnitin.com/static/plagiarism-spectrum/>

[2] Avoiding Plagiarism in Academic Writing.

<https://inside.tamuc.edu/academics/colleges/humanitiessocialsciencesarts/departments/literaturelanguages/documents/firstyearwritingprogram/Avoiding%20Plagiarism.pdf>

[3] Plagiarism in Academia-ERIC. <https://files.eric.ed.gov/fulltext/EJ909069.pdf>

[4] Meo, S. A., & Talha, M. (2019). Turnitin: Is it a text matching or plagiarism detection tool? Saudi Journal of Anaesthesia, 13(Suppl 1), S48. https://doi.org/10.4103/sja.SJA_772_18 at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6398291/>

Other Resources from TURNITIN are available at

<https://inside.tamuc.edu/facultystaffservices/academictechnology/educationaltechnology/turnitin.aspx>

Class Decorum Civility in the classroom or online course and respect for the opinions of other is very important in an academic environment. It is likely you may not agree with everything that is said or discussed in the classroom/online course. Courteous behavior and responses are expected. To create and preserve a learning environment that optimizes teaching and learning, all participants share a responsibility in creating a civil and nondisruptive forum. Students are expected to conduct themselves at all times in a manner that does not disrupt teaching or learning. Faculty have the authority to request students who exhibit inappropriate behavior to leave the class/online course and may refer serious offenses to the University Police Department and/or the Dean of Students for disciplinary action. (See Student Guidebook)

It is the policy of the University, the History Department, and the instructor that no form of plagiarism or cheating will be tolerated. Plagiarism is defined as the deliberate use of another's work and claiming it as one's own. This means ideas as well as text, whether paraphrased or presented verbatim (word-for-word). Cheating is defined as obtaining unauthorized assistance on any assignment. Collusion is defined as selling or purchasing academic products with the intention that they be submitted to fulfill an academic or course requirement. Proper citation of sources must always be utilized thoroughly and accurately. Cheating/plagiarism/collusion will result in a grade of "0" for the assignment, and may also result in failure of the course and/or disciplinary action by the University. Any student found guilty of violating academic integrity policy will fail the assignment in question, will automatically fail the course and will be subject to disciplinary action by the university (see Texas A&M University-Commerce Code of Student Conduct 5.b. [1,2,3]). Further information on the history department's plagiarism policy can be found on the department webpage. If you are unclear about what constitutes academic dishonesty, ask.

Students are encouraged to take advantage of the Writing Center's resources for assistance with drafting their written assignments. Although the center will not write your paper for you, it may help you to improve your writing skills. If you use the Writing Center, plan in advance because it can only help you if there is adequate time to incorporate their suggestions into your paper. Additionally, I am willing to read rough drafts (and even multiple drafts) of your written work so long as the drafts are submitted at least one week prior to the due date.

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>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: Netiquette

<http://www.albion.com/netiquette/corerules.html>

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>

Graduate Student Academic Dishonesty 13.99.99.R0.10

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

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/>

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.

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel