

## 2022 Summer PDAT 617 Python for Data Science Syllabus

**Instructor:** Shanshan Lv, Violette Hall 2238, [slv@truman.edu](mailto:slv@truman.edu)

**Personal Zoom Meeting ID:** 552 196 2263

**Office hour:**

	Monday	Tuesday	Wednesday	Thursday	
Morning	9:00-11:00	9:00-11:00	9:00-11:00		by
Afternoon	1:00 - 2:00	1:00-2:00		1:00-2:00	appointment

### Zoom Meeting and Office Hour Detail

Every Tuesday between 6:00 and 7:00pm, we will have our regular Zoom discussion session. All students should attend. You can attend our zoom meeting from blackboard.

**Textbook:** There is no required textbook for this course.

**Prerequisite:** Successful completion of PDAT 610G, PDAT 611G, PDAT 613G, and PDAT 615G

**Required Software:** In order to participate fully and effectively in an online course, students should have a reliable broadband connection (Cable Modem, DSL, Satellite). Note that Windows is ending technical support and security updates for Windows 7. Students should have a relatively new operating system (Windows 7 or newer; Mac OSX, etc.) and employ a compatible browser such as Chrome or Safari. Courses use Blackboard Learn. For a list of compatible systems and browser types, visit Blackboard.

This course does use audio and video. Videos are close-captioned. To benefit from the audio you will need a computer equipped with speakers. This course also involves assignments requiring audio/video submissions. Thus, your computer will need to be equipped with a camera and microphone.

### Course Description

This course introduces students to the world of data science by providing in-depth exposure to the software environment Python. Upon completion of this course, students will have a solid foundation on Data science techniques using Python.

**Objectives:** By the end of this course, a successful student will be able to achieve moderate proficiency with Python and R including:

- 1) Demonstrate proficiency using the Python programming language;
- 2) Demonstrate skills using Python for data cleaning, creating tidy datasets, and other processing, while maintaining a reproducible data trail;
- 3) Use Python to perform exploratory and statistical analyses of the data acquired;
- 4) Demonstrate proficiency in basic visualization using Python;
- 5) Use Python to build models such as regression, clustering, random trees, and random forests;

**Grade Policy:** Your grade will be based on homework assignments, and discussion.

You will work at your own pace to complete assessments. You may complete the assessments whenever you think you are ready. However, there are 8 modules for 8 weeks and typically later modules are longer than earlier module. Finishing one module a week may be the best for you to successfully digest the material. Assessments include practical application programming assignments and discussion for each course module.

Practical application programming assignments will allow you to practice the skills of the course. Programs will be graded on adherence to specifications, program quality, and correctness of results. In the course discussions, you are asked to post your own answers to discussion questions and to read the posts of other learners and provide them with feedback. Thus, you will contribute for each discussion: an initial post that addresses the discussion question and a feedback post to one or more of your peers' initial posts.

The final grade will be determined based on the practical application programming assignments covering each major area of the course and participation in discussion.

		A	90 - 100
		B	80 - 90
		C	70 -80
		D	60 - 70
		F	below 60
Assignment	100 points $\times$ 8		
Discussion	50 points $\times$ 8		
Total	1200 points		

An overall course grade lower than a "C" is considered a failing grade, and no more than one course grade of "C" may be counted toward the certificate and master's degrees. Students may retake a course to raise a grade not meeting minimum program requirements.

**Substantive Interaction:** All students are now required to have a substantive interaction with their instructor within the first week of any class. For this summer, an interaction will be defined as either attending one of the live Zoom sessions in the first week of class or the completion of the first assigned homework by the end of the first week of class. Those who have not had a substantive interaction by the end of the first week will be report to the registrar for disenrollment.

**Cheating or Facilitating Cheating** will not be tolerated in my class. Any use or attempt to use unauthorized materials, information, or study aids in any academic exercise is considered cheating.

**Minimum Computer Skills and Digital Information Literacy Skills:** Students must be able to download and save course materials to either a desktop or laptop computer, in the following formats: Microsoft Word, Excel, PowerPoint, PDF, .JPG, .TIF, .PNG. Students must be able to complete, save and upload course assignments to Blackboard in one of the following document/picture formats: Microsoft Word, PDF, .JPG, .TIF, .PNG.

### Students' and Instructor Expectation

My Expectations of Students

I expect students to: thoroughly read the required materials and complete assigned activities prior

to engaging in discussion boards; complete their assigned work; engage in active conversation with peers; engage in polite and respectful discourse with their peers; ask questions whenever they have difficulty understanding material or course requirements; express concerns about the course at any time.

#### What Students Should Expect of Me as Their Instructor

Students should expect me to: provide timely feedback on questions, activities, and assessments; provide thorough responses to questions and concerns raised throughout the course; respect diverse arguments from a variety of perspectives on the subject matter; make them aware of concerns I have with their performance or ability to succeed in the course; be available to them as a source of support in their learning. If at any time I am forced to step away from the course for more than 24 hours, such as in the case of illness or personal emergency, I will notify the class as soon as possible and provide an additional point of contact for further information.

### **Student Engagement**

#### Response Time and Feedback

Whenever you submit a question by email or phone, you can expect feedback within 24 hours on a weekday and with 72 hours on a weekend. Queries received on the last day of a weekend or a holiday break will be answered by the end of the day immediately following. You can expect feedback on most assignments within 48 hours. Where longer grading time is required, a timeframe for feedback will be shared with the assignment instructions or in a class-wide announcement.

#### Learner Interaction

You are strongly encouraged to take advantage of posted virtual office hours. If you cannot meet during the posted hours, additional appointments can be arranged. I will create a Zoom meeting space for virtual office hours and post this information in Announcements on Blackboard. Individuals needing to consult privately may do so by phone or arrange a time to conference separately.

### **Academic Honesty and Honor Code**

It is Truman's expectation that all work submitted will be the original work of only those students involved in the individual capstone research project. Use of code or libraries from any third party, including other classmates and the internet is not allowed without the express permission of the instructor. In cases where the use of third-party code is allowed, its author and source must be properly cited.

As with any online course, the temptation to cheat or plagiarize can be great. Under time constraints and pressure to complete, finding an "answer" online may seem like an easy solution, but students should keep in mind that doing so not only violates Truman's Honor Code, it defeats the purpose of taking this course. Enrollment in this course indicates a student's desire or employment requirement to actually learn the material presented, with the assumption that the student will be expected to demonstrate a working knowledge of the associated skills in the work place. Students who take the time to do the coursework themselves ensure that they are fully prepared to perform similar tasks in the work place where they will be judged by their peers and supervisors. This is the place for students to make mistakes and learn to do it right themselves.

Students may be asked to sign an honor pledge prior to submitting an assignment indicating that they have complied with the honor code. Students found to be in violation of this policy may be

removed from the course, and may receive further sanctions, up to and including referral to the Dean of Students for further investigation, depending on the severity of the incident.

### **Credit Hours**

The minimum investment of time by the average Truman student necessary to achieve the learning goals in this course are not less than two (50 minutes) hours of classroom instruction and a minimum of four hours of out of class student work each week per credit hour awarded, or at least the equivalent of six hours of laboratory work, internships, practica, and other academic work each week per credit hour awarded. This average time per week for an average student may have weekly variations.

### **Nondiscrimination and Americans with Disabilities Act Statement**

It is the goal of Truman State University to provide every student with the opportunity to learn to the best of their abilities and appropriate opportunities to demonstrate this learning. If a student has a disability for which they are or may be requesting an accommodation, they are encouraged to contact the Data Science Academic Success Mentor (x4079) and the Disability Services office (x4478) as soon as possible. For additional details, consult <http://disabilityservices.truman.edu/>.

**Students with Disabilities:** If you have a disability for which you are or may be requesting an accommodation, you are encouraged to tell your instructor about it and contact the Disability Services office (x4478) as soon as possible. For information on applying for services please see <http://disabilityservices.truman.edu/applying.asp>. They will provide you with the documentation that your instructor will need so that he may provide you with the services you need. These services may entail extended time on tests, a quiet non-distracting place to take tests, oral exams, or testing materials given in an alternate media type.

**Emergency Procedures:** In each classroom on campus, there is a poster of emergency procedures explaining best practices in the event of an active shooter/hostile intruder, fire, severe weather, bomb threat, power outage, and medical emergency. This poster is also available as a PDF at this link: <http://police.truman.edu/files/2015/12/Emergency-Procedures.pdf>

Students should be aware of the classroom environment and note the exits for the room and building. For more detailed information about emergency procedures, please consult the Emergency Guide for Academic Buildings: <http://police.truman.edu/emergency-procedures/academic-buildings/>

This six-minute video provides some basic information on how to react in the event there is an active shooter in your location: <http://police.truman.edu/emergency-procedures/active-shooter/active-shooter>

Truman students, faculty, and staff can sign up for the TruAlert emergency text messaging service via TruView. TruAlert sends a text message to all enrolled cell phones in the event of an emergency at the University. To register, sign in to TruView and click on the Truman tab. Click on the registration link in the lower right of the page under the Update and View My Personal Information channel on the Emergency Text Messaging or Update Emergency Text Messaging Information link. During a campus emergency, information will also be posted on the TruAlert website <http://trualert.truman.edu/>.

**FERPA:** Education records are protected by the Family Education Right to Privacy Act (FERPA). As a result, course grades, assignments, advising records, etc. cannot be released to third parties without your permission. There are, however, several exceptions about which you should be aware.

For example, education records can be disclosed to employees or offices at Truman who have an educational need to know. These employees and offices may include your academic advisor, the Institutional Compliance Officer, the Registrars Office, or Student Affairs depending on the type of information. For more information about FERPA, see <http://www.truman.edu/registrar/ferpa/>.

**Center for Academic Excellence:** The Center for Academic Excellence ([truman.edu](http://truman.edu)) provides advising services for students in their first year for most departments, as well as tutoring services. The Center is located in Kirk Building 112 and it may be reached at 660-785-7403.

**Counseling Services** Counseling Services ([truman.edu](http://truman.edu)) are available on campus at McKinney Center. Appointments may be scheduled by calling (660) 785-4014. An after-hours crisis line is also available at 660-665-5621.

**IT Help Desk** The IT Service Center ([truman.edu](http://truman.edu)) has combined the IT Call Center, Help Desk and Telephone Services into a one-stop location to serve you. You will find the following services and more when you stop by Pickler Library 109 or call 660-785-4544. You may submit a customer support ticket at this

**Writing Center** I encourage you to use the University's Writing Center ([truman.edu](http://truman.edu)) for your writing projects. It is not a proofreading service. The writing consultants will read your work and give you feedback, letting you know what is working well (and why) and what might not be working so well (and why). They can help you understand and better your writing craft. They can also do brainstorming if you're having a hard time getting started. And they have an online scheduler, so making an appointment is easy.

### **Title IX Federal Statutes**

Truman State University and its faculty are committed to supporting our students and fostering an environment that is free from bias, discrimination, and harassment. If a student speaks with a faculty member about an incident of misconduct, that faculty member is a "mandated reporter" and must notify Truman State University's Title IX Coordinator and share the basic fact of the experience with her. The counselors at University Counseling Services are NOT mandated reporters and they can be reached at 660-785-4014. After-hours crisis counselors can be reached at 660-665-5621. For more information regarding Truman's policies and procedures relating to any form of gender discrimination, please see <http://eoaa.truman.edu/university-non-discrimination-policy/> and <http://eoaa.truman.edu/complaint-reporting-resolution-procedure/>.

**Material:** The tentative schedule is the following.

Class Period	Section/ Topic
Week 1	Getting Started with Python.
Week 2	Numpy Array
Week 3	Pandas
Week 4	Matplotlib
Week 5	Linear Regression Models
Week 6	Cluster Analysis
Week 7	Random Trees and Random Forest
Week 8	Neural Network