

Course Information

Course Number:	URSC 689
Course Title:	Programming for Urban and Regional Analytics
Section:	
Time:	05:30 pm-08:30 pm, Every Tuesday, Spring 2023
Location:	ARCA 303
Credit Hours:	3

Instructor Details

Instructor:	Xinyue Ye
Office:	ARCA 306
Phone:	
E-Mail:	xinyue.ye@tamu.edu
Office Hours:	TBD, by appointment

Course Description

This course introduces Python programming for Urban and Regional Informatics. Concepts of object-oriented programming and scripting will be presented. Students can develop Python programming/scripting skills fundamental to the automation of urban and regional data manipulation and analysis. Besides receiving hands-on experience through designed labs, students will work on an individual term project. By the end of this course, you will: 1) Understand programming concepts, methods, and approaches; 2) Possess programming technique skills to explore and model urban and regional data.

Course Prerequisites

Graduate student classification or approval of instructor. Prior programming experience is not required, although it will be beneficial. Prior or concurrent course work in statistics analysis is encouraged.

Special Course Designation

N/A

Course Learning Outcomes

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

- 1. Develop the capability of spatial data programming using Python;*
- 2. Build fundamental urban and regional analytical programming skills;*
- 3. Design and develop tools to solve specific urban and regional information problems;*
- 4. Interpret the principles of popular urban and regional data models and algorithms;*
- 5. Evaluate the internal operations of open source (such as Python) software and applications.*

Textbook and/or Resource Materials

No textbook. Instructor will assign a set of papers as mandatory assigned reading on <https://canvas.tamu.edu/>

Slack channel (urasc689-s23-ye.slack.com) will be used for communication. Please check your canvas announcement to join the slack through the invitation link.

Grading Policy

There are two homework assignments and one term project. All of them are open book. Your grade in this course will be based on the following elements:

1. *Term Project (50 points): It needs to be delivered as a publishable paper and presentation (ppt). Please check "How to Write a Publishable Paper as a Class Project" as this link indicates (<https://gking.harvard.edu/papers>)*
2. *Two lab assignments (15 points for each assignment; total 30 points): no score will be assigned to work which misses the deadline.*
3. *Class Discussion and Attendance (20 points): the students are assigned to read the materials and need to be prepared to discuss. The attendance will be measured by the presence in the class. After one absence, the score of 20 points will be marked down by one point. The discussion will be measured by the quality of class participation based on assigned reading materials. One point will also be marked down for unprepared participation. The score of Class Discussion and Attendance will start as 20, and the minimum is 0 after reduction.*

Total Points: 100 Points (90- = A, 80-89 = B, 70-79 = C, 60-69 = D, 0-59 = F)

Course Schedule

Week	Topic
1	Why Programming
2	Computational Tools
3	Python Basics I
4	Python Basics II
5	Spatial Data
6	Spatial Weights
7	Choropleth Mapping
8	Spatial Autocorrelation
9	Point Pattern Analysis I
10	Point Pattern Analysis II
11	Spatial Inequality

12	Clustering & Regionalization
13	Spatial Regression I
14	Spatial Regression II
15	Spatial Feature Engineering
16	Final Presentation and Term Project Due

Late Work Policy

No score will be assigned to work which misses the deadline (work missed/late due to unexcused absence). Work submitted by a student as makeup work for an excused absence is not considered late work and is exempted from the late work policy ([Student Rule 7](#)).

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student’s grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor” ([Student Rule 7, Section 7.4.1](#)).

“The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence” ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See [Student Rule 24](#).)

Academic Integrity Statement and Policy

“An Aggie does not lie, cheat or steal, or tolerate those who do.”

“Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one’s work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case” ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

NOTE: Faculty associated with the main campus in College Station should use this Academic Integrity Statement and Policy. Faculty not on the main campus should use the appropriate language and location at their site.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu. Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

NOTE: Faculty associated with the main campus in College Station should use this Americans with Disabilities Act Policy statement. Faculty not on the main campus should use the appropriate language and location at their site.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is

handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

NOTE: Faculty associated with the main campus in College Station should use this Title IX and Statement on Limits of Liability. Faculty not on the main campus should use the appropriate language and location at their site.

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.

College and Department Policies

College and departmental units may establish their own policies and minimum syllabus requirements. As long as these policies and requirements do not contradict the university level requirements, colleges and departments can add them in this section.