UF UNIVERSITY of FLORIDA

URP 6272: Urban Spatial Analysis

Spring 2020

Instructor:	Dr. Emre Tepe Assistant Professor	**Time:**	Monday 10:40 AM – 12:35 PM Wednesday 10:40 AM – 11:30 AM
Email:	emretepe@ufl.edu	**Place:**	ARCH 411

Office Hours: Monday 12:50 PM – 1:40 PM & Wednesday 11:45 AM – 1:40 PM or by appointment (As a rule of office hour, students do not need to schedule a meeting in advance if they plan to see me during my office our. I will be available in my office during my office hours.)

Contact Information: Office 444, Architecture Building

Delivery Method of Course Materials: All course materials including slides, class notes, assignment instructions and course video records will be available on course page on Canvas: `https://elearning.ufl.edu`

Main References: No required text. However for students that wish more detailed information or are having trouble with concepts for this course I recommend: ESRI Book Series at: `https://esripress.esri.com/display/index.cfm`

- The ESRI Guide to GIS Analysis, Volume 1
- The ESRI Guide to GIS Analysis, Volume 2
- GIS and Cartographic Modeling
- GIS Tutorial 2
- The Esri Guide to GIS Analysis, Volume 3

Additional Resources: Over the semester, some additional references will be announced or distributed.
Software: We will use ArcGIS Pro that will be freely available on UF Apps. Also, we will learn some basic programming skills using Python language.

Course Description:
Theoretical and practical knowledge about spatial relationships as applied to urban form and the development and analysis of urban environments using geographic information systems and spatial analysis techniques such as spatial statistical modeling.

Prerequisite Knowledge and Skills: Students taking this course must have taken URP6271 Introduction to Planning Information Systems or an equivalent course recognized by the course instructor.

Purpose of Course: This course is intended to provide students with and understanding of Geostatistical analysis and spatial modeling techniques. The course also teaches students some basic GIS process modeling using the ArcGIS ModelBuilder environment. Also students will learn some basic programming skills using Python programming language. The course supports the department's mission as part of the "Planning Information Technologies" specialization and builds advanced knowledge and skills within that specialization. The course provides analysis skills that allow planning students to achieve in the area of spatial statistical analysis as

required for hypothesis testing, cluster and pattern analysis, and geospatial determinist and stochastic surface development, as well as, spatial predictive modeling. In addition effort has been made to include examples and assignments that provide opportunity to utilize statistical analysis as a problem solving/analysis methodology for urban and regional planning, planning decision making, disaster management analysis, and in support of conservation planning and sustainable development.

Course Goals and/or Objectives: By the end of this course, students will:

- Students in the course will demonstrate research and critical thinking skills reflecting comprehension with regard to the use of spatial modeling (both determinist and stochastic) for urban and regional planning.
- Students will analyze and combine qualitative and quantitative information from multiple sources to support decision-making using spatial statistical analysis.
- Students will apply knowledge of human settlement, historical and contemporary data, organizational and institutional data, and policy and processes relevant to urban and regional planning analysis.
- Students will understand professional ethics and responsibility for data analysis.
- Students will in class discuss ethical behavior, cultural sensitivity, teamwork, professional conduct and the importance of developing communication skills regarding presentations of statistical analysis techniques (visual, oral and written).

Instructional Methods: The course will have weekly lectures (normally 2) presenting concepts, techniques and methods for urban spatial analysis. A number of homework assignments will test student's understanding of the lecture presentations. Essays will require students to discuss in detail concepts and methods presented. A final presentation and paper is required. Each student's presentation will require the student to explain his/her statistical analysis using language and discussion appropriate for a meeting with members of the general public. The paper will require the student to discuss the same statistical analysis used for the presentation but directed at professional practice, research, or for the academy.

Tentative Course Outline:

- Module # 1: Measuring Geographical Distribution
  - Mean Center
  - Median Center
  - Center Feature
  - Standard Distance
  - Directional Distribution
  - Collect Events

- Module # 2: Spatial Statistics Analyzing Patterns
  - Average Nearest Neighbor
  - Spatial Autocorrelation Moran's I Index
  - High/Low Clustering Getis-Ord Gi*
  - Collect Distance Band for Neighborhood Counts
  - Incremental Spatial Autocorrelation
  - Multi-distance Spatial Cluster Analysis
  - Generating Spatial Weights Matrix
- Module # 3: Mapping Clusters
  - Anselin Local Moran's I Index
  - Hot Spots Getis-Ord Gi*
  - Optimized Outlier Analysis
  - Optimized Hot Spots Analysis
  - Grouping Analysis
- Module # 4: Modeling Spatial Regression
  - Ordinary Least Squares Regression
  - Exploratory Regression
  - Geographically Weighted Regression
- Module # 5: Geostatistical Exploration of Data
  - Histogram
  - Q-Q Plot
  - General Q-Q Plot
  - Voronoi Maps
  - Mean, Median, Mode, IQR, Entropy, Standard Deviation
  - Semivariogram
- Module # 6: Surface Modeling
  - Deterministic Modeling
  - Inverse Distance Weighted
  - Stochastic Modeling
  - Creating an Empirical Semivariogram
  - Ordinary Kriging Default Model
  - Ordinary Kriging Optimized Model
  - Ordinary Kriging Optimized Model with Trend Removal

Important Dates:

Martin Luther King Jr. Day (No Class) ..... January 20, 2020
Spring Break (No Class) ..... Feb. 29 – Mar. 7, 2020
Final Project ..... April 29, 2020 (3:00 PM - 5:00 PM)

Grade Distribution:

Assignments	60%
Final Project	40%

Letter Grade Distribution:

>= 93.00	A	73.00 - 77.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
88.00 - 89.99	B+	68.00 - 69.99	D+
83.00 - 87.99	B	58.00 - 67.99	D
80.00 - 82.99	B-	55.00 - 57.99	D-
78.00 - 79.99	C+	<= 55.99	E

Course Policy:

- In general, no late work will be accepted. However, feel free to contact me for emergency issues.
- Computer problems that arise during submission will not be accepted as an excuse for late work.
- All work must be completed and submitted by the designated time in announced platform.
- Regular attendance is essential and expected.

Honesty Policy:
The university's honesty policy regarding cheating, plagiarism, etc. Suggested wording: UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Student Evaluations:
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at this link. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via this link. Summaries of course evaluation results are available to students at this link.

Add/Drop Policy:
University policies on such matters as add/drop, incomplete, academic probation, termination of enrollment, reinstatement, and other expectations or procedures can be found in the graduate student handbook and at the Dean of Students website.

Special Accommodations:
Students requesting disability-related academic accommodations must first register with the Disability Resource Center.
The Disability Resource Center will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.