

URP 6272: URBAN SPATIAL ANALYSIS

Spring 2021 | Course URL: <https://ufl.instructure.com/courses/416924>

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:	Virtual
Office:	Architecture Building 444	Delivery:	Online (100%)
TA:	Kanglin Chen	Email:	kanglinchen@ufl.edu

Course Communication: Instructors can be reached by email or Canvas inbox. Expect a response in 48 hours, excluding holidays and weekends.

Office hours: Instructor will offer office hours to answer students' course-related questions and concerns over Zoom. Office hours will be regularly post on Canvas and students are expected to sign up for available time slots to schedule office hour meetings with the instructor.

Course materials: All course materials including slides, class notes, assignment instructions, and course video records will be available on Canvas course page: <https://elearning.ufl.edu>. It's highly recommended to check regularly the designated course page on Canvas for updates and new course materials.

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 and ArcMap that are freely available on UF Apps.

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 URP6270 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 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 G_i^*
- 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 G_i^*
- 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 18, 2021
 End of Classes April 21, 2021

Grade Distribution:

Initial Reporting 5%
 Interim Reports 40 %
 Presentation 20%
 Final Report 35%

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

Deadline of assignments: Deadlines of assignments will be posted on Canvas.

Submissions: Students must submit their assignments to the assignments in Canvas in the format identified in the instructions. Computer problems that arise during submission will generally not be accepted as an excuse for late work, but please refer to the “Getting Help” section of this syllabus about documenting technical issues with the Help Desk.

Course policies:

Make-up policy: In general, no late work will be accepted. However, feel free to contact me for emergency issues. During this difficult time, please don’t hesitate to contact the instructor about any unexpected circumstance that may affect your performance in the course.

Course technology: In this course, we will be using Canvas and UF App. You can learn more about these tools in the Start Here module and contact UF Help Desk for additional assistance at (352)392-4357, option 2.

UF policies:

University Policy on Accommodating Students with Disabilities: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which

must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

University Policy on Academic Conduct: 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.

Netiquette: All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. Refer to Netiquette Guidelines for more details.

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.

Getting Help:

For issues with technical difficulties for Canvas, please contact the UF Help Desk at:

- <http://helpdesk.ufl.edu>
- (352) 392-HELP (4357)
- Walk-in: HUB 132

Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from the Help Desk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up. Other resources are available at <http://www.distance.ufl.edu/getting-help> for:

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

Should you have any complaints with your experience in this course please visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.