

COURSE SYLLABUS

Instructor:	Dr. Kevin Ash	Term:	Spring 2023
Office:	TUR 3128	Class Meeting Days:	Wednesday
Phone:	352-294-6956	Class Meeting Hours:	1:55 pm – 4:55 pm
Email:	kash78@ufl.edu	Class Location:	TUR 3018
Office Hours:	Mon & Tues, 9-10 am; Thur, 1-2 pm; or by appt	Course Credits:	3 hours

I. Course Overview

This course provides students with basic skills and knowledge to utilize Geographic Information Systems (GIS) to map and analyze population data in geospatial formats that are widely available in the United States and many countries globally from public sources such as censuses and population surveys. Students will benefit from lab assignments using the software ArcGIS Pro (primarily) and other geospatial and quantitative analysis software platforms such GeoDa and RStudio. This course is designed to build upon human geography and population concepts learned in lower-level courses by empowering students to perform their own analyses of population data in various geographic contexts. The course thereby will provide critical training and experience for students interested to pursue more advanced applications of GIS utilizing geospatial population data to model human interaction with natural and/or built environments.

The first several weeks of the course will familiarize students with geospatial formats common for secondary population datasets such as census enumeration data, the American Community Survey, and similar publicly available population & socioeconomic surveys. Early assignments will instruct students on how to retrieve these population data, display and analyze them in GIS, how to conduct appropriate data processing steps such as data normalization in the form of rates, percentages, or ratios. Students will also learn to think critically about analysis and display of population data, including how to handle margins of error and mapping in areas with small sample sizes using smoothing methods. In the latter half of the course, students will learn how to conduct longitudinal change analyses with geospatial population datasets, including how to retrieve GIS files from the National Historical GIS database. In the final weeks of the course, we will cover multiple methods for mapping population density and measures of rurality with GIS data, and will learn how to calculate and map sociodemographic indicators pertaining to phenomena such as migration, fertility/mortality rates, segregation, poverty, and income inequality. In the final assignment, students will conduct geodemographic classification using geospatial clustering methods.

NOTE: This course is co-listed with GIS 4500 which is an undergraduate course. While the two courses will meet together and complete similar assignments and exams, undergraduate and graduate students will be evaluated on different bases. Graduate students will be required to contribute more frequently in reading discussions, complete a longer and more rigorous final project paper, and deliver a longer and more comprehensive final project presentation.

II. Course Content Objectives

By the end of the course, students will:

- Demonstrate proficiency in the use GIS software for analysis of population, demographic, and socioeconomic data.
- Identify and utilize public population data sources for geospatial analyses

- Extend understanding of concepts in population geography—such as demographic trends, migration, urban/rural differences, segregation, and socioeconomic inequality—through application of these concepts in quantitative and geospatial analyses
- Compare and contrast methodologies for the calculation and analysis of demographic and socioeconomic quantitative indicators
- Write a project paper in the style of a peer-reviewed scientific manuscript
- Give an oral and visual presentation to communicate their research methods and findings
- Constructively critique and discuss recently published peer-reviewed journal articles on the topics of population geography and GIS

III. Student Learning Outcomes

Through the course assignments and exams, students will learn to:

- Independently obtain, process, and map data generated through publicly available censuses and population surveys
- Organize, visualize, and analyze population, demographic, and socioeconomic data using ArcGIS Pro
- Conduct population analyses using a variety of geographic enumeration units
- Normalize population data using appropriate denominators, according to data quality and research goals
- Interpret and formulate conclusions with data that explicitly include uncertainty (survey margins of error)
- Understand and apply geographic data smoothing techniques
- Utilize historical census and survey data for calculation and analyses of population trends
- Map population density using a variety of cartographic techniques, including dasymetric methods
- Define, quantitatively estimate, and map population geographic patterns of rurality, segregation, inequality, human well-being, and poverty
- Generate a geodemographic classification using clustering methods

IV. Materials and Supplies: Laptop Computer

This course will be held in TUR 3018 for the Spring 2023 semester. Students must provide their own laptop computer on which to participate in discussions on Canvas prior to class, work on GIS assignments during and outside of class, and take exams via Canvas. Any required software (such as ArcGIS Pro) will be available to students through UF Apps at <https://info.apps.ufl.edu> or through student licenses provided by the instructor.

V. Required Texts and Useful Online Resources

There is no required textbook for this course. The instructor will assign readings on a weekly basis and these will be available via Canvas. Citations for the required readings are provided at the end of this document.

VI. Course Format, Activities, and Basis for Evaluation

The class will meet once per week for a three-hour time block on Wednesdays from 1:55 pm to 4:55 pm. The three-hour period will be a mix of lecture, discussion of assigned readings, and time to work on each week's GIS assignment. NOTE: The instructor will give the lectures live in TUR 3018 but will also record these lectures using Zoom and make them available via Canvas to all students in the class for study & review purposes only; these recordings are not to be distributed publicly or made available to anyone outside the course without the written permission of the instructor. To clarify: this is not a HyFlex course. Students are expected to attend class in TUR 3018 unless they have documented reasons for absence.

The camera will remain on the instructor during lecture recordings. Students are still encouraged to ask questions during the lectures. The best method for doing so is to log in to Zoom with cameras and microphones off on a laptop computer and pose questions using the chat window to avoid being heard or seen on the recordings. The reason for recording lectures is to provide students the opportunity to re-watch lectures to better learn the material in the course, as there is no textbook for this course.

Regarding the risk of the spread of COVID-19 and variants: UF expects students, faculty, and staff to limit exposure and spread of COVID-19 on campus within the current guidelines in which we are operating. This includes an expectation of wearing masks in the building and during class, encouragement to get vaccinated to reduce likelihood of severe health impacts of

COVID-19, and reminders to consider social distancing in the classroom, where possible. These policies are subject to change according to university and government guidelines.

Evaluation and Grading

Class Participation & Reading Discussions: Class participation will be evaluated based on two components. The first is attendance which will count for 5% of the final grade. Students are expected to attend class for each of the 15 class periods during the semester. Students may be excused from absences with appropriate documentation according to the university policy (more information provided in Section IX below). The other 25% in class participation will be discussion of the weekly readings in written format on Canvas and verbally during class. Students will be required to post their own summaries and critiques the day before class online and discuss the papers further during class periods. An evaluation rubric is provided below.

Rubric for Evaluation: Online Readings Summaries/Critiques

Task: Write a 300-500 word summary and critique of the weekly assigned readings and submit it via Canvas the day before class. Consult the rubric below to make sure you include all required elements to receive full credit.

(Adapted from two sources: Solan & Linardopoulos 2011, http://jolt.merlot.org/vol7no4/linardopoulos_1211.htm; Reflection/Discussion Critique Rubric, <http://www.rcampus.com/rubricshowc.cfm?sp=yes&code=D97AAC&>.)

Evaluation Category	Standards for Excellent Work	Points	Instructor Comments
Summary of Key Concepts	<ul style="list-style-type: none"> -Demonstrate comprehension of key concepts from readings -Recognize & define key concepts in summary -Use terms & concepts appropriately in context 	/4	
Evaluation & Synthesis of Key Concepts	<ul style="list-style-type: none"> -Construct generalized judgments and/or arguments about key concepts in readings -Support arguments using specific instances or examples from the readings 	/6	
Critique Strategies	<ul style="list-style-type: none"> -Employ one or more critique strategies such as: <ul style="list-style-type: none"> ▪ Compare/contrast between readings ▪ Deconstruction of language or logic ▪ Identification of methodological shortcomings 	/6	
Writing & Communication Proficiency	<ul style="list-style-type: none"> -Organize writing with clear structure: <ul style="list-style-type: none"> ▪ Introduction ▪ Body ▪ Conclusion -Avoid spelling, grammar, syntax, punctuation, or other writing errors 	/4	

GIS Assignments: There will be 10 GIS assignments which will amount to 40% of the final grade. GIS assignments will be due one week after they are assigned; exceptions to this are noted in the course schedule. The grade will be determined using the best 9 grades out of the 10 assignments, with the lowest grade being dropped.

Final Project: For the final project, students will use one or more of the GIS methods for analysis of population data covered in the course to perform their own analysis for a location and context of their choosing. The final project paper should be about 3000 words in length and include citations, data tables, and maps and graphs as appropriate. The project will be worth 30% of the total grade. Most of the points (20 out of the 25 percentage points) will be related to the paper which each student will write and turn in by May 4th. The remaining 5 percentage points will be for an 12-minute presentation given on April 26th. Students will write a short project proposal that will be due Mar 22nd and will receive constructive feedback and guidance about the proposed research. More detailed instructions about the final project will be provided to students via Canvas and during class meetings.

Assignments and Exams	Percent of Final Grade
Participation & Reading Discussions	30%
GIS Assignments	40%
Final Project Presentation	5%
Final Project Paper	25%

Grading Scale (%)	
92.5 – 100	A
89.5 – 92.4	A-
86.5 – 89.4	B+
82.5 – 86.4	B
79.5 – 82.4	B-
76.5 – 79.4	C+
72.5 – 76.4	C
69.5 – 72.5	C-
66.5 – 69.4	D+
62.5 – 66.4	D
59.5 – 62.4	D-
< 59.5	E

VII. **Important Dates to Remember:** The due dates below are tentative and can be changed at the discretion of the instructor.

Drop/Add Ends:	Fri, Jan 13 th 2023
Final Project Proposal Due	Wed, Mar 22nd 2023
Spring Break	Mon-Fri, Mar 13-17 th 2023
Reading Days	Thurs-Fri, Apr 27-28 th 2023
Final Project Paper Due	Thurs, May 4th 2023
Spring 2023 Grades Available on https://one.uf.edu/dashboard/	Wed, May 10 th 2023

VIII. **Weekly Topic Schedule, Assignments, and Exams (Schedule is provisional and subject to change)**

Date	Day	Class Topics & Assignments	Read Before Class
Jan 11	Wed	Course Introduction; GIS Assignment #1	None
Jan 18	Wed	Working with Census Datasets in ArcGIS; GIS Assignment #2; Assignment #1 due	Martin 2011; Logan 2018
Jan 25	Wed	Data Standardization in GIS; GIS Assignment #3; Assignment #2 due	Boeckel & Otterstrom 2009; Rutan & Glass 2018;

Feb 1	Wed	American Community Survey, Uncertainty, & GIS; GIS Assignment #4; Assignment #3 due	Sun et al. 2015; Boscoe et al. 2022
Feb 8	Wed	Small Area Estimation & Geographic Data Smoothing; GIS Assignment #5; Assignment #4 due	Hester et al. 2012; Dai et al. 2013
Feb 15	Wed	Methods for Mapping Population Density; GIS Assignment #6; Assignment #5 due	Jia et al. 2014; Wardrop et al. 2018
Feb 22	Wed	Measuring & Mapping Rurality Using GIS; GIS Assignment #7; Assignment #6 due	Waldorf & Kim 2015; Inagami et al. 2016
Mar 1	Wed	Longitudinal Population Change Using GIS; GIS Assignment #8; Assignment #7 due	McKee et al. 2015; Logan et al. 2016
Mar 8	Wed	Introduction of Final Project; Work on Project Proposal; Assignment #8 due	None
Mar 15	Wed	NO CLASS, SPRING BREAK	
Mar 22	Wed	Mapping the Human Development Index; GIS Assignment #9; project proposal due	Permanyer 2013; Hou et al. 2015
Mar 29	Wed	GIS and Indices of Poverty & Deprivation; GIS Assignment #10; Assignment #9 due	Porter 2012; Butler et al. 2013
Apr 5	Wed	GIS & Inequality Measures; Assignment #10 due; Work on final project	Rey & Smith 2013; Florida & Mellander 2016
Apr 12	Wed	Spatial Segregation & Diversity Indices; Work on final project	Franklin 2014; Yao et al. 2019
Apr 19	Wed	Geodemographic Regionalization; Work on final project	Singleton & Spielman 2014; Major et al. 2018
Apr 26	Wed	Student presentations on final project; Work on final project papers	None
May 4	Thurs	Final Project Papers Due by 5 pm on May 4	

IX. Course Policies: Attendance, Make-Ups, and Grades

Attendance: Students are expected to attend each class period. Absences can be excused with proper documentation according to university policy. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Make-Up Exams and Assignments: Requirements for make-up exams, assignments, and other work in this course are consistent with university policies that can be found at <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

Examination Policies and Reading Days: Course policies are consistent with University policies on during-term exams, final exams, reading days, and make-up exams. Students must notify the instructor as soon as possible in case of absence during an exam and provide documentation as to the reason for the absence. If deemed an excused absence, the student will be permitted a reasonable amount of time to make up the missed exam. More details can be found at <https://catalog.ufl.edu/UGRD/academic-regulations/examination-policies-reading-days/>.

Grade Dissemination: You can access your scores at any time using the Grade function in Canvas. The instructor will post grades within about one week of the due date of each assignment and reading discussion.

Grading Policies for Assigning Grade Points: Information on current UF grading policies for assigning grade points may be found at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

Grades of "Incomplete": The current university policy concerning incomplete grades will be followed in this course. An incomplete grade may be assigned at the discretion of the instructor as an interim grade for a course in which you have completed a major portion of the course with a passing grade, been unable to complete course requirements before the end of the term because of extenuating circumstances and obtained agreement from the instructor and arranged for resolution of the incomplete grade. Instructors are not required to assign incomplete grades.

X. Course Policies: Technology and Media

Email: Each of you has a UF email address. It is vital that you maintain an active UF email account and that you **check it often**. This tentative syllabus is **subject to change**, and any changes will be transmitted to you via your UF email account and Canvas (see below). Students should email the instructor if they have questions about any of the lectures, readings, assignments, or exams. You should expect a response within about 24 hours during weekdays. On holidays or weekends, expect a response on the next business day. The instructor will reasonably expect similar time frames for responses to emails sent to students.

Canvas: Course materials such as lectures, readings, the syllabus, and assignment instructions will be available through Canvas (<https://elearning.ufl.edu>). You will also find all due dates and grades on Canvas. Students must activate their UF GatorLink account in order to use Canvas. If you need help learning how to perform various tasks related to this course or other courses that utilize Canvas, please consult the above webpage. You may also contact the UF Computing Help Desk at (352) 392-HELP(4357) or helpdesk@ufl.edu.

Online Course Evaluation: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing online evaluations via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. 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 <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

In-Class Recording: Students can record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

XI. Course Policies: Student Expectations

Disabilities Statement:

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center (352-392-8565, <https://disability.ufl.edu/get-started/>). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Academic Honesty & Conduct Policy: 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 (<https://sccr.dso.ufl/process/student-conduct-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.

XII. Campus Resources for Students:

Academic Resources

E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via email at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services at career.ufl.edu/.

Library Support: <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring. <http://teachingcenter.ufl.edu/>

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. <http://writing.ufl.edu/writing-studio/>

Student Complaints On-Campus: sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/

On-Line Students Complaints: distance.ufl.edu/student-complaint-process/

Health and Wellness Resources

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit umatter.ufl.edu/ to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit <https://counseling.ufl.edu/> or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit <https://shcc.ufl.edu/>.

University Police Department: Visit police.ufl.edu/ or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; ufhealth.org/emergency-room-trauma-center.

XIII. Assigned Readings Citations:

Boeckel, M.A., and S.M. Otterstrom, 2009. From Wilderness to Megalopolis: A Comparative Analysis of County Level Sex Ratios in the United States from 1790 to 1910 Using a Historical GIS, *Social Science Computer Review*, 27:297-312.

Boscoe, F.P., B. Liu, J. Lafantasia, L. Niu, and F.F. Lee, 2022. Estimating uncertainty in a socioeconomic index derived from the American Community Survey, *SSM-Population Health*, 18:101078.

- Butler, D.C., S. Petterson, R.L. Phillips, and A.W. Bazemore, 2013. Measures of Social Deprivation That Predict Health Care Access and Need within a Rational Area of Primary Care Service Delivery, *Health Services Research*, 48:539-559.
- Dai, D., Y. Zhang, C.A. Lynch, T. Miller, and M. Shakir, 2013. Childhood drowning in Georgia: A geographic information system analysis, *Applied Geography*, 37:11-22.
- Florida, R., and C. Mellander, 2016. The geography of inequality: Difference and determinants of wage and income inequality across US metros, *Regional Studies*, 50:79-92.
- Franklin, R., 2014. An Examination of the Geography of Population Composition and Change in the United States, 2000-2010: Insights from Geographical Indices and a Shift-Share Analysis, *Population, Space and Place*, 20:18-36.
- Hester, L., X. Shi, and N. Morden, 2012. Characterizing the geographic variation and risk factors of fatal prescription opioid poisoning in New Hampshire, 2003-2007, *Annals of GIS*, 18:99-108.
- Hou, J., P.P. Walsh, and J. Zhang, 2015. The dynamics of Human Development Index, *The Social Science Journal*, 52:331-347.
- Inagami, S., S. Gao, H. Karimi, M.M. Shendge, J.C. Probst, and R.A. Stone, 2016. Adapting the Index of Relative Rurality (IRR) to Estimate Rurality at the ZIP Code Level: A Rural Classification System in Health Services Research, *The Journal of Rural Health*, 32:219-227.
- Jia, P., Y. Qiu, and A.E. Gaughan, 2014. A fine-scale spatial population distribution on the High-resolution Gridded Population Surface and application in Alachua County, Florida, *Applied Geography*, 50:99-107.
- Logan, J.R., B.J. Stults, and Z. Xu, 2016. Validating Population Estimates for Harmonized Census Tract Data, 2000-2010, *Annals of the American Association of Geographers*, 106:1013-1029.
- Logan, J.R., 2018. Relying on the Census in Urban Social Science, *City & Community*, 17:540-549.
- Major, E., E.C. Delmelle, and E. Delmelle, 2018. SNAPScapes: Using Geodemographic Segmentation to Classify the Food Access Landscape, *Urban Science*, 2:71.
- Martin, D., 2011. Directions in Population GIS, *Geography Compass*, 5:655-665.
- McKee, J.J., A.N. Rose, E.A. Bright, T. Huynh, and B.L. Bhaduri, 2015. Locally adaptive, spatially explicit projection of US population for 2030 and 2050, *Proceedings of the National Academy of Sciences*, 112:1344-1349.
- Permanyer, I., 2013. Using Census Data to Explore the Spatial Distribution of Human Development, *World Development*, 46:1-13.
- Porter, J.R., 2012. A Simplified Indicator of Social Well-Being in the United States: Examining the Ecological Impact of Family Formation within a County Level Framework, *Social Indicators Research*, 108:421-440.
- Rey, S.J., and R.J. Smith, 2013. A spatial decomposition of the Gini coefficient, *Letters in Spatial and Resource Sciences*, 6:55-70.
- Rutan, D.Q., and M.R. Glass, 2018. The Lingering Effects of Neighborhood Appraisal: Evaluating Redlining's Legacy in Pittsburgh, *The Professional Geographer*, 70:339-349.
- Singleton, A.D., and S.E. Spielman, 2014. The Past, Present, and Future of Geodemographic Research in the United States and United Kingdom, *The Professional Geographer*, 66:558-567.

- Sun, M., D.W. Wong, and B.J. Kronenfeld, 2015. A Classification Method for Choropleth Maps Incorporating Data Reliability Information, *The Professional Geographer*, 67:72-83.
- Waldorf, B., and A. Kim, 2015. Defining and Measuring Rurality in the US: From Typologies to Continuous Indices, Workshop on Rationalizing Rural Area Classifications, Keck Center, Washington, DC.
http://sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_167036.pdf
- Wardrop, N.A., W.C. Jochem, T.J. Bird, H.R. Chamberlain, D. Clarke, D. Kerr, L. Bengtsson, S. Juran, V. Seaman, and A.J. Tatem, 2018. Spatially disaggregated population estimates in the absence of national population and housing census data, *Proceedings of the National Academy of Sciences*, 115:3529-3537.
- Yao, J., D.W.S. Wong, N. Bailey, and J. Minton, 2019. Spatial Segregation Measures: A Methodological Review, *Tijdschrift voor Economische en Sociale Geografie*, 110:235-250.