

## Cover Sheet: Request 12963

### GEO 4XXX Spatial Econometrics and Modeling (co-listed with grad)

#### Info

Process	Course New Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Robert Walker roberttwalker@ufl.edu
Created	8/23/2018 11:39:38 AM
Updated	5/3/2019 12:55:03 PM
Description of request	The request is to create a new course that will be offered by the Geography Department. It will be co-listed with a graduate level course.

#### Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CLAS - Geography 011609000	Jane Southworth		8/23/2018
No document changes					
College	Conditionally Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane	The College Curriculum Committee conditionally approves, with the following: 1) submit this as only the 4000-level course; 2) remove the syllabus; 3) change course description to meet catalog style; 4) use letter grades and not grade points in the grading scale; 5) need full set of links and policies per syllabus.ufl.edu	10/14/2018
Consultation Form updated.pdf					
Department	Approved	CLAS - Geography 011609000	Jane Southworth		8/29/2018 1/4/2019
No document changes					
College	Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane		1/12/2019
No document changes					
University Curriculum Committee	Commented	PV - University Curriculum Committee (UCC)	Lee Morrison	Added to February agenda.	2/15/2019
No document changes					
University Curriculum Committee	Conditionally Approved	PV - University Curriculum Committee (UCC)	Casey Griffith	Please provide responses to UCC review subcommittee comments in Feb. email. (also available on Feb. UCC review document)	2/19/2019
No document changes					
College	Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane		3/17/2019
No document changes					
University Curriculum Committee	Commented	PV - University Curriculum Committee (UCC)	Lee Morrison	Added to April agenda.	4/12/2019

Step	Status	Group	User	Comment	Updated
No document changes					
University Curriculum Committee	Recycled	PV - University Curriculum Committee (UCC)	Casey Griffith	Please respond to UCC comments regarding exam week and upload a syllabus.	4/16/2019
No document changes					
College	Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane		4/22/2019
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			4/22/2019
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

# Course|New for request 12963

## Info

**Request:** GEO 4XXX Spatial Econometrics and Modeling (co-listed with grad)

**Description of request:** The request is to create a new course that will be offered by the Geography Department. It will be co-listed with a graduate level course.

**Submitter:** Robert Walker roberttwalker@ufl.edu

**Created:** 5/3/2019 12:52:03 PM

**Form version:** 21

## Responses

### Recommended Prefix

*Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.*

Response:  
GEO

### Course Level

*Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.).*

Response:  
4

### Number

*Enter the three digit code indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this may be XXX until SCNS assigns an appropriate number.*

Response:  
XXX

### Category of Instruction

*Indicate whether the course is introductory, intermediate or advanced. Introductory courses are those that require no prerequisites and are general in nature. Intermediate courses require some prior preparation in a related area. Advanced courses require specific competencies or knowledge relevant to the topic prior to enrollment.*

Response:  
Advanced

- 1000 and 2000 level = Introductory undergraduate
- 3000 level = Intermediate undergraduate
- 4000 level = Advanced undergraduate
- 5000 level = Introductory graduate
- 6000 level = Intermediate graduate
- 7000 level = Advanced graduate

*4000/5000 and 4000/6000 levels = Joint undergraduate/graduate (these must be approved by the UCC and the Graduate Council)*

**Lab Code**

Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:  
None

**Course Title**

Enter the title of the course as it should appear in the Academic Catalog.

Response:  
Spatial Econometrics and Modeling

**Transcript Title**

Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 21 characters (including spaces and punctuation).

Response:  
Spatial Econometrics

**Degree Type**

Select the type of degree program for which this course is intended.

Response:  
Baccalaureate

**Delivery Method(s)**

Indicate all platforms through which the course is currently planned to be delivered.

Response:  
On-Campus

**Co-Listing**

Will this course be jointly taught to undergraduate, graduate, and/or professional students?

Response:  
Yes

**Co-Listing Explanation**

Please detail how coursework differs for undergraduate, graduate, and/or professional students. Additionally, please upload a copy of both the undergraduate and graduate syllabus to the request in .pdf format.

Response:  
Expectations for undergraduate and graduate students will be different as follows:

Fewer Assignments and Less Rigorous Examinations:

Undergraduates will be responsible for the first 3 assignments and not assignment 4 (on Bayesian methods).

Graduate students will be responsible for all 4 assignments.

Undergraduates will neither present nor write a class paper.

Graduate students will prepare and present a research paper.

Undergraduates will have 4 days to complete the take-home tests.

Graduates have 2 days to complete the tests.

Undergraduates will not be tested on Bayesian methods on the final test.

Graduates will be tested on Bayesian methods on the final test.

Undergraduates will have a less difficult grading scale than Graduate Students (see syllabi):

Grading Scale (Undergraduate):

87.0 - 100: A  
84.0 - 86.99: A-  
81.0 - 83.99: B+  
78.0 - 80.99: B  
75.0 - 77.99: B-  
72.0 - 74.99: C+  
69.0 - 71.99: C  
66.0 - 68.99: C-  
63.0 - 65.99: D+  
60.0 - 62.99: D  
50.0 - 59.99: D-  
0.0 - 49.99: E

Grading Scale (Graduate):

96.0 - 100: A  
87.0 - 95.99: A-  
84.0 - 86.99: B+  
86.0 - 83.99: B  
78.0 - 85.99: B-  
75.0 - 77.99: C+  
70.0 - 74.99: C  
68.0 - 69.99: C-  
65.0 - 67.99: D+  
60.0 - 64.99: D  
55.0 - 59.99: D-  
0.0 - 54.99: E

### **Effective Term**

*Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.*

Response:

Fall

**Effective Year**

Select the requested year that the course will first be offered. See preceding item for further information.

Response:  
2018

**Rotating Topic?**

Select "Yes" if the course can have rotating (varying) topics. These course titles can vary by topic in the Schedule of Courses.

Response:  
No

**Repeatable Credit?**

Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:  
No

**Amount of Credit**

Select the number of credits awarded to the student upon successful completion, or select "Variable" if the course will be offered with variable credit and then indicate the minimum and maximum credits per section. Note that credit hours are regulated by Rule 6A-10.033, FAC. If you select "Variable" for the amount of credit, additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:  
3

**S/U Only?**

Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission.

Response:  
No

**Contact Type**

Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:  
Regularly Scheduled

- Regularly Scheduled [base hr]
- Thesis/Dissertation Supervision [1.0 headcount hr]
- Directed Individual Studies [0.5 headcount hr]
- Supervision of Student Interns [0.8 headcount hr]
- Supervision of Teaching/Research [0.5 headcount hr]
- Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

### Weekly Contact Hours

Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course.

Response:

3

### Course Description

Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 50 words or fewer. See course description guidelines.

Response:

Introduces regression models capable of dealing with spatial auto-correlation. Students develop statistical models and estimate with computer software.

### Prerequisites

Indicate all requirements that must be satisfied prior to enrollment in the course. Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be formulated so that it can be enforced in the registration system. Please note that upper division courses (i.e., intermediate or advanced level of instruction) must have proper prerequisites to target the appropriate audience for the course.

Response:

GEO 4167, Intermediate Quantitative Analysis, or equivalent

Completing Prerequisites on UCC forms:

- Use "&" and "or" to conjoin multiple requirements; do not use commas, semicolons, etc.
- Use parentheses to specify groupings in multiple requirements.
- Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would only require a grade of D-.
- Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
- "Permission of department" is always an option so it should not be included in any prerequisite or co-requisite.

Example: A grade of C in HSC 3502, passing grades in HSC 3057 or HSC 4558, and major/minor in PHHP should be written as follows:

HSC 3502(C) & (HSC 3057 or HSC 4558) & (HP college or (HS or CMS or DSC or HP or RS minor))





- Binmore, K.G. 1982. *Mathematical Analysis: A Straightforward Approach* (2nd edition). Cambridge: Cambridge University Press.
- Greene, W.H. 2000. *Econometric Analysis*, 4th ed. New Jersey: Prentice Hall
- Griffith, D.A., Amrhein, C.G. 1991. *Statistical Analysis for Geographers*. Englewood Cliffs, New Jersey: Prentice Hall.
- Hoel, P.G., Port, S.C., and Stone, C.J. 1971. *Introduction to Probability Theory*. (Vol 1) Boston: Houghton Mifflin Company.
- Hoel, P.G., Port, S.C., and Stone, C.J. 1971. *Introduction to Statistical Theory*. (Vol 2) Boston, Houghton Mifflin Company.
- LeSage, J.P. Bayesian estimation of limited dependent variable spatial autoregressive models. *Geographical Analysis* 32(1): 19-35.
- LeSage, J. P. and Pace, R. K. 2009. *Introduction to Spatial Econometrics*. Boca Raton, FL: CRC Press.
- Miller, R.E. 2000. *Optimization: Foundations and applications*. New York: John Wiley & Sons, Inc.
- Smith, T.E. and LeSage, J.P. 2004. A Bayesian probit model with spatial dependencies, in *Spatial and Spatiotemporal Econometrics*. LeSage, J.P. and Pace, R.K. (eds). Amsterdam: Elsevier.
- Zellner, A. 1971. *An Introduction to Bayesian Inference in Econometrics*. New York: John Wiley & Sons, Inc.

### **Weekly Schedule of Topics**

*Provide a projected weekly schedule of topics. This should have sufficient detail to evaluate how the course would meet current curricular needs and the extent to which it overlaps with existing courses at UF.*

Response:

Week 1 Introduction

Week 2 Data Arrays and Matrix Algebra. Intro to MATLAB

Week 3 Labor Day Holiday

Week 4 Principles of Probability (Inference, Bias) Intro to GeoDa

Assignment 1. Arrays, Matrices and MATLAB

Exercises in presentation of data in matrix form. Exercises in MATLAB manipulating data arrays.

Due the following Monday

Week 5 Data Generating Processes; the Regression Model

Week 6 Spatial Representation, Data Types

Assignment 2. GeoDa, Regression and Probability

Exercises using GeoDa for standard regression. Interpretation of results. Exercises on inference and bias. Due the following Monday

Week 7 Spatial Regression, Preliminaries GeoDa applications.

Test 1 Administered. Take Home.

All course materials from Week 1 to Week 6

Due on Friday for Grad students, and Monday for Undergraduates

Week 8 The "Spatial Error and Lag Models" MATLAB Library

Week 9 The “Sac Model,” the “Durbin Model”

Week 10 Grad Student Presentations: Objectives and Data

Assignment 3. MATLAB and Spatial Regression

Implementing spatial regressions with MATLAB. Exercises in applications of Spatial Error, Lag, Sac, and Durbin Models. Interpretation of results. Identification of spatial autocorrelation.

Due the following Monday.

Week 11 Model Selection and goodness-of-fit

Week 12 Bayesian probability and inference

Week 13 Bayesian regression; Limited dependent variables in spatial context

Implementing Bayesian spatial regressions with MATLAB Due the Monday after Thanksgiving break

Week 14 Nov 20: Thanksgiving Break.

Week 15 Grad Student Presentations: Analysis and Findings

Undergraduates in Attendance

Test 2 Administered. Take Home.

All course materials from Week 7 to Week 15

Due on Friday for Grad students, and Monday for Undergraduates

## Links and Policies

*Consult the syllabus policy page for a list of required and recommended links to add to the syllabus. Please list the links and any additional policies that will be added to the course syllabus.*

*Please see: [syllabus.ufl.edu](https://syllabus.ufl.edu) for more information*

Response:

Class Attendance and Make-Up Policy

Class attendance is expected. Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

Makeups for the Mid-term and Final will be provided for students who miss either exam due to extreme, documented circumstances. Late homework assignments will also be accepted under similar circumstances. Students should arrange with the instructor for makeup material, and the student will receive one week to prepare for any makeup assignment, if circumstances allow it.

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://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.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Class Demeanor

Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Materials and Supplies Fees

There are no additional fees for this course.

University Honesty 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://www.dso.ufl.edu/sccr/process/student-conducthonor-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 in this class. Counseling and Wellness Center Contact information for the Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies. U Matter, We Care: If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) or 352 392-1575 so that a team member can reach out to the student. Information on current UF grading policies for assigning grade points can be found in the following link: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

### **Grading Scheme**

*List the types of assessments, assignments and other activities that will be used to determine the course grade, and the percentage contribution from each. This list should have sufficient detail to evaluate the course rigor and grade integrity. Include details about the grading rubric and percentage breakdowns for determining grades.*

Response:

The course is presented in lecture format, with some practical lab-oriented instruction in computational methods.

Grades for undergraduates are determined on the basis of homework assignments and tests (mid-term and final), with homework accounting for 60% (20 points for each of 3 assignments), and the two tests, 20% each. Homework can be done in groups working together; tests are to be completed on the basis of individual effort. Undergraduates will not be responsible for Bayesian materials on the final test. Undergraduates will not write a class paper.

Grading Scale (Undergraduate):

Percent Grade

87.0 - 100: A  
84.0 - 86.99: A-  
81.0 - 83.99: B+  
78.0 - 80.99: B  
75.0 - 77.99: B-  
72.0 - 74.99: C+  
69.0 - 71.99: C  
66.0 - 68.99: C-  
63.0 - 65.99: D+  
60.0 - 62.99: D  
50.0 - 59.99: D-  
0.0 - 59.99: E

**Instructor(s)**

*Enter the name of the planned instructor or instructors, or "to be determined" if instructors are not yet identified.*

Response:

Robert Walker

External Consultation Results (departments with potential overlap or interest in proposed course, if any)

Department	Name and Title
_____	_____
Phone Number	E-mail
_____	_____
Comments	

Department	Name and Title
_____	_____
Phone Number	E-mail
_____	_____
Comments	

Department	Name and Title
_____	_____
Phone Number	E-mail
_____	_____
Comments	

**Spatial Econometrics and Modeling**  
**GEO 4938 & LAS 4953**  
**Dr. Robert Walker**  
**Office: 3310 Turlington Hall**  
**Phone Number 352-392-0494 (work phone)**  
**Email: [roberttwalker@ufl.edu](mailto:roberttwalker@ufl.edu)**

**Class meeting times:** Thursday 9:35AM – 12:35PM (periods 3-5)  
**Office Hours:** Thursday 1:00PM – 3:00PM or by appointment

This course addresses spatial statistical models, from both theoretical and empirical perspectives. It shows students how to assess the presence of spatial autocorrelation in their data, and how to specify appropriate regression models that produce reliable results when spatial autocorrelation is present. As a consequence, students learn to implement a variety of spatial models, developed by econometricians and spatial analysts in geography. Spatial lag and spatial error models are addressed, as are situations with complex autocorrelation patterns affecting independent variables, and error terms and dependent variables simultaneously. The instructional premise of the course is that such methods should not be approached via “cook-book,” but instead by considering the underlying estimation theory. Thus, we will spend time at the beginning dusting off a few mathematical preliminaries in order to have notational facility with matrix algebra, and an intuitive understanding of basic probabilistic concepts. We will address estimation by considering the so-called “maximum likelihood function,” and also by reference to Bayesian inference. On this basis, we will develop the models of interest, namely spatial regression techniques for both continuous and discrete dependent variables. Students will be introduced to an extensive spatial-econometrics library, with MATLAB scripts written for a wide variety of statistical situations, such as panel analysis, truncated dependent variables, etc. The course will be conducted primarily in MATLAB and GeoDa, both available from UF APPs. We will have occasion to use Stata and R, as well. The course is open to both advanced undergraduate and graduate students. Grades will be determined by homework and tests, and graduate students will write and present a research paper.

**Grading:** The course is presented in lecture format, with some practical lab-oriented instruction in computational methods. Grades for undergraduates are determined on the basis of homework assignments and tests (mid-term and final), with homework accounting for 60% (20 points for each of 3 assignments), and the two tests, 20% each. Homework can be done in groups working together; tests are to be completed on the basis of individual effort. Undergraduates will not be responsible for Bayesian materials on the final test. Nor will they be responsible for writing a class paper.

**Grading Scale (Undergraduate):**

87.0 - 100: A  
84.0 - 86.99: A-  
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72.0 - 74.99: C+  
69.0 - 71.99: C  
66.0 - 68.99: C-  
63.0 - 65.99: D+  
60.0 - 62.99: D  
50.0 - 59.99: D-  
0.0 - 49.99: E

**Pre-requisites:** The pre-requisite for this class is GEO 4167, Intermediate Quantitative Analysis, or equivalent. More importantly, students must be motivated by an interest in spatial analysis, and a willingness to do the work. I will not lecture on advanced mathematics, but I will show how it is used by economists and geographers to arrive at key results. I do hope to advance student knowledge of matrix notation, insofar as it is used as a shorthand for describing data-sets, and as the basic set-up for estimating regression models. That is, I do not expect students to become experts in solving systems of equations by brute force. I do hope that they will learn the easy route of doing such solutions with software like MATLAB. Bottom-line: You do not need to have a strong math background to succeed in this class. You simply need to be a good student, which you no doubt are.

**Testing:** The two tests will be administered as open book, take home tests. The second test will be handed out on the last day of class. If you find this conflicts with your reading days, please let me know in advance. I will not give early tests to accommodate personal travel. Undergraduate Students will have 4 days to complete each test.

**Readings:** I draw my readings from a wide cross-section of literature, books, published articles, etc. These readings are meant to provide background, and I do not expect you to digest the materials in their entirety, as they can be quite mathematical. But you will have them in your virtual archives for future reference as you go on to apply what you learn. The prime textual information will come from my lectures. It will often be the case that I will call attention to some aspect of the readings, and elaborate the main points in my class presentations. I will do my best to make my class notes available on the Canvas system.

Information on current UF grading policies for assigning grade points can be found in the following link: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

### **Course Policies and Useful Information:**

*Class Attendance and Make-Up Policy* Class attendance is expected. Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation. Makeups for the Mid-term and Final will be provided for students who miss either exam due to extreme, documented circumstances. Late homework assignments will also be accepted under similar circumstances. Students should arrange with the instructor for makeup material, and the student will receive one week to prepare for any makeup assignment, if circumstances allow it.

*Students Requiring Accommodations* Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://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.

*Course Evaluation* Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the

last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

*Class Demeanor* Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

*Materials and Supplies Fees* There are no additional fees for this course.

*University Honesty 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://www.dso.ufl.edu/sccr/process/student-conducthonor-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 in this class.

*Counseling and Wellness Center* Contact information for the Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

*U Matter, We Care:* If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) or 352 392-1575 so that a team member can reach out to the student.



## Class Calendar

Week 1	Introduction
Week 2	Data Arrays and Matrix Algebra. Intro to MATLAB
Week 3	Labor Day Holiday
Week 4	Principles of Probability (Inference, Bias) Intro to GeoDa Assignment 1. Arrays, Matrices and MATLAB Exercises in presentation of data in matrix form. Exercises in MATLAB manipulating data arrays. Due the following Monday
Week 5	Data Generating Processes; the Regression Model
Week 6	Spatial Representation, Data Types Assignment 2. GeoDa, Regression and Probability Exercises using GeoDa for standard regression. Interpretation of results. Exercises on inference and bias. Due the following Monday
Week 7	Spatial Regression, Preliminaries GeoDa applications. Test 1 Administered. Take Home. All course materials from Week 1 to Week 6 Due on Friday for Grad students, and Monday for Undergraduates
Week 8	The “Spatial Error and Lag Models” MATLAB Library
Week 9	The “Sac Model,” the “Durbin Model”
Week 10	Grad Student Presentations: Objectives and Data. Undergraduates in attendance Assignment 3. MATLAB and Spatial Regression Implementing spatial regressions with MATLAB. Exercises in applications of Spatial Error, Lag, Sac, and Durbin Models. Interpretation of results. Identification of spatial autocorrelation. Due the following Monday.
Week 11	Model Selection and goodness-of-fit
Week 12	Bayesian probability and inference
Week 13	Bayesian regression; Limited dependent variables in spatial context Implementing Bayesian spatial regressions with MATLAB Due the Monday after Thanksgiving break
Week 14	Nov 20: Thanksgiving Break.
Week 15	Grad Student Presentations: Analysis and Findings

Undergraduates in Attendance  
Test 2 Administered. Take Home.  
All course materials from Week 7 to Week 15  
Due on Friday for Grad students, and Monday for Undergraduates

## COURSE RESOURCES

Anselin, L. 1988. *Spatial Econometrics Methods and Models*. The Netherlands: Kluwer Academic Publishers.

Anselin, L. 2003. Spatial externalities, spatial multipliers, and spatial econometrics. *International Regional Science Review* 26(2): 153-166.

Anselin, L. 2005. *Exploring Spatial Data with GeoDa: A Workbook*. Center for Spatially Integrated Social Science, Spatial Analysis Laboratory (<http://sal.uiuc.edu>)

Binmore, K.G. 1982. *Mathematical Analysis: A Straightforward Approach* (2<sup>nd</sup> edition). Cambridge: Cambridge University Press.

Greene, W.H. 2000. *Econometric Analysis*, 4<sup>th</sup> ed. New Jersey: Prentice Hall

Griffith, D.A., Amrhein, C.G. 1991. *Statistical Analysis for Geographers*. Englewood Cliffs, New Jersey: Prentice Hall.

Hoel, P.G., Port, S.C., and Stone, C.J. 1971. *Introduction to Probability Theory*. (Vol 1) Boston: Houghton Mifflin Company.

Hoel, P.G., Port, S.C., and Stone, C.J. 1971. *Introduction to Statistical Theory*. (Vol 2) Boston, Houghton Mifflin Company.

LeSage, J.P. Bayesian estimation of limited dependent variable spatial autoregressive models. *Geographical Analysis* 32(1): 19-35.

LeSage, J. P. and Pace, R. K. 2009. *Introduction to Spatial Econometrics*. Boca Raton, FL: CRC Press.

Miller, R.E. 2000. *Optimization: Foundations and applications*. New York: John Wiley & Sons, Inc.

Smith, T.E. and LeSage, J.P. 2004. A Bayesian probit model with spatial dependencies, in *Spatial and Spatiotemporal Econometrics*. Lesage, J.P. and Pace, R.K. (eds). Amsterdam: Elsevier.

Zellner, A. 1971. *An Introduction to Bayesian Inference in Econometrics*. New York: John Wiley & Sons, Inc.