

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	3/17/2019 4:29:45 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	Conditionall 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	Conditionall 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	Pending	PV - University Curriculum Committee (UCC)			3/17/2019

Step	Status	Group	User	Comment	Updated
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: 3/14/2019 1:48:44 PM

Form version: 12

Responses

Recommended Prefix GEO

Course Level 4

Number XXX

Category of Instruction Advanced

Lab Code None

Course Title Spatial Econometrics and Modeling

Transcript Title Spatial Econometrics

Degree Type Baccalaureate

Delivery Method(s) On-Campus

Co-Listing Yes

Co-Listing Explanation Expectations for graduate and undergraduate students will be different as follows:

Additional Assignments and Examinations

Graduate students prepare and present a research paper; undergraduates do not.

More Rigorous Assignments and Examinations

Graduates will have 2 days to finish take-home tests; undergraduates, 4 days.

More Demanding Performance Criteria

Graduates will have a more difficult grading scale than undergraduates (see syllabi)

Effective Term Fall

Effective Year 2018

Rotating Topic? No

Repeatable Credit? No

Amount of Credit 3

S/U Only? No

Contact Type Regularly Scheduled

Weekly Contact Hours 3

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

Prerequisites

GEO 4167, Intermediate Quantitative Analysis, or equivalent

Co-requisites none

Rationale and Placement in Curriculum Spatial econometrics and modeling are increasingly important in geography, economics, sociology, epidemiology, ecology, geology, and other disciplines. There is not a course that teaches how to implement the appropriate spatial methods. There are econometrics courses and spatial statistics courses, but none that combine the two subjects. It fits into the curriculum by adding an advanced methods course to geography focused explicitly on spatial regression. It adds an advanced elective in statistical methods for cognate disciplines.

Course Objectives Students who successfully complete this course will be able to:

- 1) assess the presence of spatial autocorrelation in data sets;
- 2) mathematically represent the nature of spatial relations in data sets;
- 3) conduct a spatial analysis by implementing a variety of spatial regression techniques;
- 4) use MATLAB and GeoDa software.

The achievement of these objectives will be measured by both homework assignments and testing.

Course Textbook(s) and/or Other Assigned Reading

Recommended text:

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

Background Materials:

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 (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 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

Assignment 4. Bayesian Regression

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

Week 14 Nov 20: Thanksgiving Break. (Assignment 4)

Week 15 Limited dependent variables in spatial context

Week 16 Grad Student Presentations: Analysis and Findings. 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 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/) 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-conduct/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 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.

Grading Scheme

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 40%, and the two tests, 30% each. Homework can be done in groups working together; tests are to be done as an individual effort.

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) 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
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Comments	