NEW COURSE FORM

1.	**General Information.**								
a.	Submitted by the College of:	Arts & Sciences				Today's Date:	10/18/2011		
b.	Department/Division:	GEOGRAPHY							
c.	Contact person name:	Matthew Zook		Email:	zook@uky.edu		Phone:	510-410-1410	
d.	Requested Effective Date:	☒ Semester following approval		OR	☐ Specific Term/Year[1] :	_____			
2.	**Designation and Description of Proposed Course.**								
a.	Prefix and Number:	GEO609							
b.	Full Title:	GIScience Fundamentals							
c.	Transcript Title (if full title is more than 40 characters):	GIScience Fundamentals							
d.	To be Cross-Listed[2] with (Prefix and Number):	_____							
e.	Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours[3] for each meeting pattern type.								
	3 Lecture	_____ Laboratory[1]		_____ Recitation		_____ Discussion		_____ Indep. Study	
	_____ Clinical	_____ Colloquium		_____ Practicum		_____ Research		_____ Residency	
	_____ Seminar	_____ Studio		_____ Other – Please explain:		_____			
f.	Identify a grading system:	☒ Letter (A, B, C, etc.)		☐ Pass/Fail					
g.	Number of credits:	3							
h.	Is this course repeatable for additional credit?						YES ☐	NO ☒	
	If YES:	Maximum number of credit hours:	_____						
	If YES:	Will this course allow multiple registrations during the same semester?					YES ☐	NO ☐	
i.	Course Description for Bulletin:	This course introduces students to the use of geographic information systems and the science behind their use. Topics include an introduction to types of geographic information and data; the sources, constraints, and uses of data; the techniques for processing and visualizing spatial data and the methodological, epistemological and ontological issues associated with GIScience.							
j.	Prerequisites, if any:	_____							
k.	Will this course also be offered through Distance Learning?						YES[4] ☐	NO ☒	
l.	Supplementary teaching component, if any:	☐ Community-Based Experience		☐ Service Learning		☐ Both			
3.	**Will this course be taught off campus?**						YES ☐	NO ☒	
4.	**Frequency of Course Offering.**								

[1] Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.

[2] The chair of the cross-listing department must sign off on the Signature Routing Log.

[3] In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, represents at least two hours per week for a semester for one credit hour. (from *SR 5.2.1*)

[4] You must *also* submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.

NEW COURSE FORM

a.	Course will be offered (check all that apply):	☒ Fall	☐ Spring	☐ Summer	
b.	Will the course be offered every year?			YES ☒	NO ☐
	If NO, explain:	_____			
5.	**Are facilities and personnel necessary for the proposed new course available?**			YES ☒	NO ☐
	If NO, explain:	_____			
6.	**What enrollment (per section per semester) may reasonably be expected?**	10			
7.	**Anticipated Student Demand.**				
a.	Will this course serve students primarily within the degree program?			YES ☒	NO ☐
b.	Will it be of interest to a significant number of students outside the degree pgm?			YES ☒	NO ☐
	If YES, explain:	Students in a range of disciplines, e.g., Anthropology, Forestry, Soil Science, etc., will likely find this course of interest.			
8.	**Check the category most applicable to this course:**				
	☒ Traditional – Offered in Corresponding Departments at Universities Elsewhere				
	☐ Relatively New – Now Being Widely Established				
	☐ Not Yet Found in Many (or Any) Other Universities				
9.	**Course Relationship to Program(s).**				
a.	Is this course part of a proposed new program?			YES ☐	NO ☒
	If YES, name the proposed new program:	_____			
b.	Will this course be a new requirement[5] for ANY program?			YES ☐	NO ☒
	If YES[5], list affected programs:	_____			
10.	**Information to be Placed on Syllabus.**				
a.	Is the course 400G or 500?			YES ☐	NO ☒
	If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in ***10.b***. You must include: (i) identification of additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See *SR 3.1.4*.)				
b.	☐	The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from ***10.a*** above) are attached.			

[5] In order to change a program, a program change form must also be submitted.

NEW COURSE FORM

Signature Routing Log

General Information:

Course Prefix and Number: GEO 609

Proposal Contact Person Name: Matthew Zook Phone: 510-410-1410 Email: zook@uky.edu

INSTRUCTIONS:
Identify the groups or individuals reviewing the proposal; note the date of approval; offer a contact person for each entry; and obtain signature of person authorized to report approval.

Internal College Approvals and Course Cross-listing Approvals:

Reviewing Group	Date Approved	Contact Person (name/phone/email)	Signature
Chair, Geography	10/17/11	Sue Roberts / 7-2399 / sueroberts@uky.edu	
DGS, Geography	10/17/11	Michael Samers / 7-2931 / Michael.Samers@uky.edu	
College of A&S	11/08/11	Anna Bosch, Assoc. Dean / 7-6689 / bosch@uky.edu	
		/ /	
		/ /	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision[6]
Undergraduate Council			
Graduate Council	3/9/12	Dr. Brian Jackson	
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

[6] Councils use this space to indicate approval of revisions made subsequent to that council's approval, if deemed necessary by the revising council.

Geography 609-001
GISCIENCE FUNDAMENTALS

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Lecture/lab: MWF 11:00-11:50, CB313

Office hours: MW 10:00-10:50 (and by appointment)

Bulletin Course Description

This course introduces students to the use of geographic information systems and the science behind their use. Topics include an introduction to types of geographic information and data; the sources, constraints, and uses of data; the techniques for processing and visualizing spatial data and the methodological, epistemological and ontological issues associated with GIScience.

I. Course Description

This course will serve as an introduction to the concepts, techniques, and histories that motivate geographic information systems. This course will simultaneously expose students to key moments in the academic literature that gave rise to GIS in the discipline of geography while providing the necessary, introductory skills to operate ArcGIS. GIS brings together traditional cartographic principles, computer-assisted analytical cartography, relational database design, and digital image processing and analysis to enable people to develop geospatial databases, analyze those databases, and use maps and other visual representations as part of this analysis. This course will help you develop conceptual and applied understandings of the following fundamental principles of GIS: the representation of spatial objects, spatial analysis and modeling techniques, spatial data types, sources, and structures, and principles of cartographic representation and communication. The lectures, readings, laboratory and project activities are designed to provide you with a solid grounding in the disciplinary histories that enable GIS, concepts that underlie GIS, an understanding of how spatial analysis and representation are carried out with GIS, and experience using a desktop GIS software. No previous work in GIS or computer programming is necessary. Previous computer experience with MS Windows operating systems is helpful.

II. Course Objectives

In addition to building technical skills and competencies, students will also develop skills in critical thinking and communication. GIS, as a technology, did not simply appear out of thin air, and this course is structured so that technical skills are historically and socially situated. Furthermore, while this course does emphasize the necessary skills to *practice* GIS, it also recognizes that the practice of GIS is not universal. There are multiple ways in which these systems are developed and implemented. As such, this course will expose students to this multiplicity, while giving them the necessary skills to be successful in more advanced courses in GIS development and implementation.

Student Learning Outcomes

After taking this course, students will be able to:

- Apply multiple thematic mapping techniques to represent geographic information, choosing an appropriate representation for your data set or project goal;
- Apply principles of map design to create a map that is coherent and convincing, as well as technically correct;
- Explain how spatial and attribute data are represented in a GIS, and understand the implications of these different data models;
- Perform basic analytic operations in a GIS, including data query, buffer, overlay, and reclassification;
- Create and implement simple cartographic models using a GIS software;
- Critically analyze cartographic and GIS applications to assess some of their potential social and political implications.

III. Format

This course will be composed of lecture and laboratory sessions. Lecture sessions will be discussion based, and will cover the majority of the conceptual and historical material. Lecture is not duplicative of the textbook. There will be assigned readings, and part of students' assessments will be based on their contributions to in-class discussions. In laboratory sessions, students will be expected to work constructively with their fellow classmates in developing a comprehensive understanding of the introduction techniques in ArcGIS software.

IV. Required Texts

The required textbook for this class is the *Getting to Know ArcGIS Desktop* (3rd edition, updated for ArcGIS 10), available at the university bookstore. There is also be a reading packet available from my course website under the 'teaching' tab at http://matthew-w-wilson.com. Students who have not taken a cartography course are recommended to review *Making Maps* by Krygier and Wood.

V. Assignments, Activities, and Grading

Assessment Overview.
Students will be assessed in this course using a variety of methods. Attendance and participation in class activities will greatly improve students' abilities to master the lecture and laboratory material. Assessment is distributed in the following ways, for a total of 400 points:

- Micro-lab 1 (35 points) 8.75%
- Micro-lab 2 (35 points) 8.75%
- Journal exercise (50 points) 12.5%
- Comprehensive-lab (60 points) 15%
- Class Participation (20 points) 5%
- Final project (100 points) 25%
- Research paper (100 points) 25%

Final grades will be based on a standard scale, i.e., A=90-100%; B=80-89%; C=70-79%; E=less than 70%. Grades for all assignments will be available via the University of Kentucky Blackboard system.

Micro-laboratory exercises.
During the first half of the semester, two micro-laboratory exercises will be completed. These exercises ask students to demonstrate competencies based on the exercises in the *Getting to Know ArcGIS* textbook.

Journal exercise.
During the semester, we will be reading selections from the GIS & Society tradition. Each week, one member of the class will be asked to lead discussion of a particular reading in conjunction with the themes of the course. In preparation for this, you will be asked to complete a review of your assigned journal article, to be turned in on the day you lead discussion. Your journal article review needs to be no more than two pages double-spaced, and should answer the following four questions, in your own words: what key concepts are needed to understand this article?, what is the argument of the article?, what evidence is provided to support this argument?, and what is the significance of this article? Title each of these four sections accordingly.

Comprehensive-laboratory exercise.
Following the completion of the micro-laboratory exercises, students will be asked to complete one comprehensive-laboratory exercise. This exercise will draw on the competencies in the *Getting to Know ArcGIS* textbook, and prepare students for designing and implementing the final project.

Class Participation.
While attendance will not be graded, students are expected to participate in class discussions. Throughout the semester, short in-class assignments will be given and will contribute to your class participation evaluation at the completion of the course.

Final project.
The final project is a collaborative project. Students will need to identify one partner. No groups of more than two individuals. For the final project, students will be asked to demonstrate competencies in at least four skill areas: data organization, data transformations, spatial analysis, and cartographic representation. Students will need to develop a research question that is addressable given data availability and produce documentation to support the approach. Student partners will evaluate group member contributions. Each group will be asked to turn in a 1-page description of the proposed final project. During the final week of class, the group will present the results of the final project. The group will also be asked to submit a final report. Both the presentation and the final report will need to document the research question, data sources, method, results, and limitations.

Research paper.
Students will write and revise a paper based on the topics of the course and in consultation with the instructor. When appropriate, the research paper could support the student's research project as part of their degree program.

VI. Important Notices

Prepare for this course.
Review the course syllabus carefully, paying special attention to due dates and assignment instructions. In addition to a final project, there are four major laboratory deliverables in this course and each one builds off the previous, so attendance and participation are crucial. If you have

questions about course expectations as overviewed by this syllabus, please contact me as soon as possible.

Attend class.
Attendance is not taken nor required, however, note that:

1. the majority of your grade depends on your preparation for, and engagement in, class discussions and group work;
2. your success in completing the laboratory components, journal exercise, final project, and exams largely depends on how well you understand the material that we will cover in lecture and in lab;
3. throughout the semester, I may assign work to be completed and handed in during class or at our next meeting; you will be responsible for submitting these for credit even if you do not attend class; and
4. in the event of an absence, you should consult the syllabus regarding what material or deadlines you may have missed.

Students need to notify the professor of absences prior to class when possible. S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit "reasonable cause for nonattendance" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (859-257-2754). Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused or unexcused) per university policy.

Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request "appropriate verification" when students claim an excused absence because of illness or death in the family. Appropriate notification of absences due to university-related trips is required prior to the absence.

Be in contact.
You are responsible for checking your UKY email account; the class listserv is what I will use to send communications outside class. Email is the best way to contact me (place 'GEO309' in the subject heading). Please allow at least 24 hours for a response by email during weekdays. I will not necessarily respond to emails over the weekends.

Be a resource for others.
I strongly encourage you to exchange contact information with classmates, in order to retrieve notes and information that you may have missed.

Get help.
This course is based on a progression of lectures and lab assignments. If you are having difficulty with any course material, please contact me. There are also other resources which you should find useful:

- GIS and Cartography Labs
  5 Miller Hall
  http://www.uky.edu/AS/Geography/CartLab/

- The University Writing Center:
  http://www.uky.edu/AS/English/wc/
- Map Collections, Science Library
  410C King Library
  http://libguides.uky.edu/maps
- Stress Management Workshops
  Frazee Hall
  http://www.uky.edu/StudentAffairs/Counseling/
- On reading an academic journal article:
  http://www.brockport.edu/sociology/journal.html

Meet deadlines.
Meeting deadlines is an important professional practice. Consult the course schedule, below, for the due dates of the course assignments. A 10-percent deduction will be applied to the final score of your assignment for submissions after the deadline on the same calendar day, with an additional 10-percent deduction for each additional calendar day the assignment is late. If the assignment is not delivered by the next class meeting, the assignment will not be accepted.

Be honest.
This course, if successful, will expose you to a variety of concepts and techniques. You are expected to draw upon these various ideas, but you must be transparent and honest about your use of these ideas. Please get help if you're uncertain about this expectation! Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the *Code of Student Rights and Responsibilities*. Complete information can be found at the following website: http://www.uky.edu/Ombud. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of *Student Rights and Responsibilities* (available online http://www.uky.edu/StudentAffairs/Code/part2.html) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these *Rules* shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

For students with special needs:
If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

VII. Schedule

Subject to change.

Week	Monday	Wednesday	Friday
1: Aug. 24, 26	- - -	1. Course introduction 2. Introductory GIS concepts L1	Read Dobson 1983. Lab introduction GTK: Chs. 1-2
2: Aug. 29, 31 Sept. 2	GTK: Chs. 3-4	CLASS WILL NOT MEET Work on GTK.	CLASS WILL NOT MEET Work on GTK.
3: Sept. 5, 7, 9	LABOR DAY NO CLASS	Read Bolstad 2008 ch. 3. Read Crampton 1994. 1. Data types 2. Thematic map types L2	1. Coordinates and projections 2. Measurement frameworks GTK: Chs. 5-7
4: Sept. 12, 14, 16	Read Couclelis 1992. 1. Vector and raster data models 2. Topology L3	Current Topics: *Everyday Mappings*	GTK: Chs. 8-9

Week	Monday	Wednesday	Friday
5: Sept. 19, 21, 23	Read Bolstad 2008 ch. 8. Read Taylor 1990 & Openshaw 1991. 1. Attribute tables 2. Relational databases L4	Queries	GTK: Chs. 10-13
6: Sept. 26, 28, 30	Read Steinitz et al. 1976. 1. Spatial measurement 2. Reclassifications L5	1. Spatial analysis 2. Buffers **ML1 DUE** end of class	GTK: Chs. 14-15
7: Oct. 3, 5, 7	Read Tobler 1959. More on cartographic principles L6	Current Topics: *Is Cartography Dead?*	GTK: Chs. 16-17
8: Oct. 10, 12, 14	Read Nyerges 1991. Vector analysis techniques L7	Networks	GTK: Chs. 18-20
9: Oct. 17, 19, 21	**ML2 DUE** end of class	Review Week 1 through Week 7	Brainstorm Final Project
10: Oct. 24, 26, 28	Read Bolstad 2008 ch. 14. Read Schuurman 2005. 1. Data sources 2. Data acquisition 3. Data entry L8	Review laboratory techniques Introduce CL	Continue work on CL Turn in **Final Project Proposal**
11: Oct. 31 Nov. 2, 4	Read Goodchild 1987. 1. Raster data storage 2. Raster data operations L9	Continue work on CL	Continue work on CL
12: Nov. 7, 9, 11	Read Chrisman 1999. Spatial models and modeling L10	**CL DUE** end of class Work on final projects	Continue work on final projects

Week	Monday	Wednesday	Friday
13: Nov. 14, 16, 18	Read Crampton 1995. Ethics, access, and implications L11	Current Topics: *PGIS and the Military*	Review Week 9 through Week 12
14: Nov. 21, 23, 25	Continue work on final projects	THANKSGIVING NO CLASS	THANKSGIVING NO CLASS
15: Nov. 28, 30 Dec. 2	Continue work on final projects	Continue work on final projects	Continue work on final projects
16: Dec. 5, 7, 9	Final project presentations	Final project presentations	Final project presentations

Final Meeting: Friday, Dec. 16, 1:00 pm.
For this final meeting, please bring your final project deliverable and your collaborative-process evaluation form. Have a great holiday break!

VIII. References

Bolstad, Paul. 2008. *GIS Fundamentals: A First Text on Geographic Information Systems*. White Bear Lake, MN: Eider Press.

Chrisman, Nicholas R. 1999. What does 'GIS' mean? *Transactions in GIS* 3 (2):175-186.

Couclelis, Helen. 1992. People manipulate objects (but cultivate fields): Beyond the raster-vector debate in GIS. *Lecture Notes in Computer Science* 639:65-77.

Crampton, Jeremy W. 1994. Cartography's Defining Moment: The Peters Projection Controversy, 1974-1990. *Cartographica* 31 (4):16-32.

Crampton, Jeremy W. 1995. The Ethics of GIS. *Cartography and Geographic Information Systems* 22 (1):84-89.

Dobson, Jerome E. 1983. Automated Geography. *The Professional Geographer* 35 (2):135-143.

Goodchild, Michael F. 1987. A spatial analytical perspective on geographical information systems. *International Journal of Geographical Information Systems* 1 (4):327-334.

Nyerges, Timothy L. 1991. Analytical Map Use. *Cartography and Geographic Information Systems* 18 (1):11-22.

Openshaw, Stan. 1991. A view on the GIS crisis in geography, or, using GIS to put Humpty-Dumpty back together again. *Environment and Planning A* 23 (5):621-628.

Steinitz, Carl, Paul Parker, and Lawrie Jordan. 1976. Hand-Drawn Overlays: Their History and Prospective Uses. *Landscape Architecture*:444-455.

Schuurman, Nadine. 2005. Social Perspectives on Semantic Interoperability: Constraints on Geographical Knowledge from a Data Perspective. *Cartographica* 40 (4):47-61.

Taylor, Peter J. 1990. GKS. *Political Geography Quarterly* 9:211-212.

Tobler, Waldo R. 1959. Automation and Cartography. *Geographical Review* 49 (4):526-534.