The University Of Toledo

Existing Graduate Course Modification Form

* denotes required fields

Contact Person*: Daniel J. Hammel   Phone: 530-4128   (xxx - xxxx)   Email:
dan.hammel@utoledo.edu

Present	**Proposed**
Supply all information asked for in this column.(Supply core, research intensive and transfer module info if applicable)	Fill in appropriate blanks only where entry differs from first column.

College*: College Lang, Lit, and Soc Sci ▼   **College**: College Lang, Lit, and Soc Sci ▼

Dept/Academic Unit*:   **Dept/Academic Unit**:
Geography and Planning ▼   Geography and Planning ▼

Course Alpha/Numeric*: GEPL -   **Course Alpha/Numeric**: GEPL -
5180   5180

Course Title: **Course Title:**
Geographic Information Systems Applications   Geographic Information Systems Applications

Credit hours: Fixed: 04 or Variable: ___ to ___   **Credit Hours:** Fixed: 03 or Variable: ___ to ___

CrossListings: **CrossListings:**
GEPL 4180   GEPL 4180

[Insert]   [Insert]

To add a course, type in course ID and click the Insert button.   To add a course, type in course ID and click the Insert button.

To remove a course, select the course on left and click the Remove button.   To remove a course, select the course on left and click the Remove button.

[Remove]   [Remove]

Prerequisite(s)(if longer than 50 characters, please place it in Catalog Description):   **Prerequisite(s)**(if longer than 50 characters, please place it in Catalog Description):
GEPL 4110 or GEPL 5110   GEPL 4110 or GEPL 5110

Corequisite(s)(if longer than 50 characters, please place it in Catalog Description):   **Corequisite(s)**(if longer than 50 characters, please place it in Catalog Description):

Catalog Description (*only if changed*) 75 words max: **Catalog Description** (*only if changed*) 75 words max:

Has course content changed?   ○ Yes   ◉ No

If course content is changed, give a brief topical outline of the revised course below(less than 200 words)

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There is no change to content.
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Proposed effective term*: 201740   (e.g. 201140 for 2011 Fall)

File Type	View File
Syllabus	View

List any course or courses to be deleted.   Effective Date:

Effective Date:

Comments/Notes:

Rationale:

Several years ago GEPL changed its technology based courses from 3 to 4 hours to include a short laboratory component. Currently, four hour courses make it difficult for our graduate students to register for the required 9 hours. Four hour courses also make it difficult for MA students to finish their degree without going over the required 36 hours. We have decided to eliminate the lab component and reduce the class to 3 hours, but keep the content the same. Students will have to do more of assignments and projects independently, but we do not anticipate problems. Instructors and teaching assistants in the course are generally available and our computer laboratory is staffed by a graduate student monitor during most business hours with experience in GIS.

Approval:

		Date	
Department Curriculum Authority:	Beth Schlemper	Date	2017/01/07
Department Chairperson:	Daniel Hammel	Date	2017/01/17
College Curriculum Authority or Chair:	David Black	Date	2017/01/27
College Dean:	Barbara Schneider	Date	2017/03/30
Graduate Council:	Constance Schall, GC mtg 4/18/17	Date	2017/04/19
Dean of Graduate Studies:	Amanda C. Bryant-Friedrich	Date	2017/05/01
Office of the Provost :		Date	

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Administrative Use Only

Effective Date: (YYYY/MM/DD)
CIP Code:
Subsidy Taxonomy:
Program Code:
Instructional Level:

Registrar's Office Use Only

Processed in Banner on:

Processed in Banner by:

Banner Subject Code:

Banner Course Number:

Banner Term Code:

Banner Course Title:

Department of Geography and Planning
The University of Toledo
Spring 2018

Instructor: Dr. Yanqing Xu   Office: SM 3035
E-mail: yanqing.xu@utoledo.edu   Phone: (419)530-4196
Office Hours: 12:45-3:15 pm Tuesday and Thursday, or by appointment

Teaching Assistant: Daniel Serfas
E-mail: daniel.serfas@rockets.utoledo.edu
Office: SM 2170A
Office Hour: 10:00-11:00 am Thursday, or by appointment

COURSE OVERVIEW

This course covers advanced topics in Geographic Information Systems. Through reading, lectures, and lab assignments, we are destined to design and implement your GIS based research project. We will have lectures and readings in the first half of the semester. In the second half of the semester, each individual in the class will focus on his/her own research project. The final exam will include a term paper and a class representation.

The course is designed to provide an environment where you will receive significant hands-on experience in the use of geographic information systems in the solution of spatially oriented problems. The principal objective of the course is to advance your knowledge and skills in geographic information systems (GIS) to better utilize this technology in professional practice.

We will emphasize "hands-on" experience as much as possible to assist you in becoming an independent problem solver who understands GIS as a technology that can be utilized effectively to address a specific problem or set of issues. In addition, you will develop these skills with respect to how you can use GIS in collaboration with clients and colleagues who may not have extensive knowledge in GIS.

PREREQUISITES

It is assumed that you have at least one introductory statistic and one GIS class (using ArcGIS as the platform). Students entering this course GEPL 5180 must have successfully completed *Geographic Information Systems* GEPL 4110/5110 (or equivalent) with a satisfactory grade. Motivation is the key to success in this class (and beyond): motivated to learn some valuable skills and get stated with real research!

MATERIALS

Text (All are references):

(1) *Quantitative Methods and Socio-Economic Applications in GIS*, by Fahui Wang, Second Edition, 2014, CRC Press, Boca Raton, FL.

(2) *Mastering ArcGIS*, by Maribeth Price, Seventh Edition, 2014, McGraw-Hill Higher Education, New York, NY.

(3) *The ESRI Guide to GIS Analysis II: Spatial Measurements & Statistics*, by Andy Mitchell, 2005, ESRI Press, Redlands, CA.

Course Management System:

Blackboard
https://blackboard.utdl.edu

Software requirement: ArcGIS 10.1 or above; Microsoft Office

Workspace

Students will have some limited storage space for their documents, which is provided by the lab. But it is recommended that each student prepare their own workspace with plug-and-play USB drives.

Computer usage and software

Lab room SM2170 is restricted to teaching and has limited open hours for the students. The instructor will provide students with single-user license software during the class.

In-class activities:

The instructor will lead the class through some hand-on tutorials of specific operations in ArcGIS. The results will be counted as in-class activities.

EVALUTION

The only way to learn GIS is to practice, practice and practice. The course is projects-oriented. Concepts, methods and skills are built into each project. Grades will be assigned as follows:

≥ 94	= A	73-76	= C
90-93	= A-	70-72	= C-
87-89	= B+	67-69	= D+
83-86	= B	63-66	= D
80-82	= B-	60-62	= D-
77-79	= C+	<60	= F

COURSE OUTLINES (tentative plan)

I.   Warm-up with GIS
     A. Map projections and Spatial Data Models
     B. Attribute Data Management and Attribute Join
     C. Spatial Analysis Tools in ArcGIS: Queries, Spatial Joins, and Map Overlays
     Project 1: Mapping and Analyzing Population Density Pattern

II. Measuring Distance and Time
     A. Measure of Distance
     B. Computing Network Distance and Time
     Project 2: Estimating Travel Time Matrix by ArcMap and Google Maps API

III. Spatial Smoothing and Spatial Interpolation
     A. Spatial Smoothing
     B. Point-Based Spatial Interpolation
     C. Area-Based Spatial Interpolation
     Project 3: Spatial Smoothing and Spatial Interpolation of Place Names in Guangxi, China

IV. GIS-Based Spatial Accessibility Measures
     A. Issues on Accessibility
     B. Floating Catchment Area Methods
     C. Gravity-Based and Generalized 2SFCA Methods
     Project 4: Measuring Primary Care Accessibility in Chicago

V.   Programming in GIS
     Project 5: Programming in Visual Studio

The description and value of each part is as follows:

Activity	Description		Weight	Due Data
Class Participation	In-class Assignment/Participation in Discussion		5%	
Lab Assignments	5 labs, 8% each (TA grade)		40%	Post on Blackboard
Mid-Term Examination	Article Review (TA grade)		10%	Mar 17 12:40 pm
Final Project (35%)	In class oral presentation 10%	Instructor grade	5%	May 5 10:15-12:15 pm
		TA grade	5%	
	Final project report (instructor grade)		25%	May 6 10:00 pm
Research Paper*	25 to 30 page literature review on topic related to GIS Applications		10%	May 6 10:00 pm
Total			100%	

*Graduate Students Only

Tentative Schedule – Subject to change		
Week #	*Class Dates*	*Topic*
Week 1	Jan 12	Course Overview
	Jan 14	Warm-up with GIS
Week 2	Jan 19	Warm-up with GIS
	Jan 21	Lab 1
Week 3	Jan 26	Measuring Distance and Time
	Jan 28	Lab 2
Week 4	Feb 2	Measuring Distance and Time
	Feb 4	Lab 2
Week 5	Feb 9	Spatial Smoothing and Spatial Interpolation
	Feb 11	Lab 3
Week 6	Feb 16	Spatial Smoothing and Spatial Interpolation
	Feb 18	Lab 3
Week 7	Feb 23	GIS-Based Spatial Accessibility Measures
	Feb 25	Lab 4
Week 8	Mar 1	GIS-Based Spatial Accessibility Measures
	Mar 3	Lab 4
Week 9	**Mar 8 (No class)**	**Spring Break**
	Mar 10(No class)	
Week 10	Mar 15	Programming in GIS
	Mar 17	**Midterm**
Week 11	Mar 22	Programming in GIS
	Mar 24	Lab 5
Week 12	**Mar 29 (No class)**	**AAG Annual Meeting**
	Mar 31 (No class)	
Week 13	Apr 5	Work on Final Project
	Apr 7	
Week 14	Apr 12	Work on Final Project
	Apr 14	
Week 15	Apr 19	Work on Final Project
	Apr 21	
Week 16	Apr 26	Final Project Presentations
	Apr 28	
Week 17	**Final Exam Week**	**Final Paper Due: May 6**

POLICIES

Class attendance

Students are expected to attend regularly all classes in which they are enrolled. It is the responsibility of the student to notify the instructor ahead of time of an absence. Your participation in the learning activities provided during class is important to your learning success in this course and is assessed for grading purposes. All students are expected to come to class prepared and on time, and remain for the full class period.

Make-up & late work policy

Make-up exam will only be arranged with an official doctor's "note" or some other official documentation. All lab assignments are due at the due date posted on Blackboard. This course has step-by-step lab assignments. The practical lab exercises provide a way to acquire skills in displaying, processing, and analyzing geospatial data. ArcGIS software will be used as the major software for lab exercises. Assignments submitted after the deadline are considered late and will be penalized. Late work is accepted up to five days after the due date, with a 10% penalty for each day late.

Email and class messages

The best way to reach me is by e-mail as I check it often. The University is using only the official "utoledo" email addresses for all email correspondence to students. Please send any questions and other correspondence to me with your University of Toledo e-mail address. It also helps to put the course name in the subject line, such as "GIS".

Office Hours

Please stop by my office hours to discuss any concerns or questions you have about the course and its contents. If these times are inconvenient for you, I am happy to schedule an appointment with you. If you have an appointment with me and conflict arises, please let me know as soon as possible.

Scholastic Dishonesty

Academic work submitted by students shall be the result of their thought, research, or self-expression. Academic work is defined as, but not limited to tests, quizzes, whether taken electronically or on paper; projects, either individual or group; classroom presentations, and homework. I will not tolerate academic dishonesty. It is your responsibility to know what constitutes academic dishonesty. If you are unsure, you should consult the University policy in the Student Handbook and the University Catalog.

Accommodations and Accessibility

Any student needing to arrange a reasonable accommodation for a documented disability should contract the Office of Accessibility at Rocket Hall Room 1820, 530-4981 (voice), 530-2612 (TTY).