

PLAN 5356/4395: INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS

Instructor: Dr. Jianling Li
Wednesday, 3:00 pm ~ 5:50 pm
Room: ARCH103E

CONTACT INFORMATION

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Office hours: Wednesday, 1:00 PM – 3:00 PM, and by appointment

COURSE DESCRIPTION AND OBJECTIVES

Geographic Information Systems (GIS) is a rapidly developing technology with wide applications to many disciplines. Over the years, GIS has been used in various areas such as planning, public administration, business operation, engineering, *etc.* It is a useful tool to visualize spatial locations, patterns, and trends and to present information. Some advanced GIS applications also enable users to construct spatial models and integrate with other modeling techniques. Urban planners and city managers can use GIS to address various planning and management issues, such as analyzing and visualizing spatial distribution of population, housing demand, traffic pattern, business locations, land use, utility and transportation facilities. Researchers can use GIS to create spatially related data, conduct spatial analysis, and display results for the subject of their research.

The purpose of this class is to provide students with basic GIS concepts and essential skills to construct maps that can be used for a variety of planning and research purposes. Students will learn both the technical operation of a GIS program and the application of the techniques to planning research and practices. The course consists of lectures and labs.

MEASURABLE STUDENT LEARNING OUTCOMES

After completing this class, students will be able to:

- Display feature and tabular data
- Query features
- Analyze the spatial relationships of features
- Create new feature classes
- Edit spatial data
- Convert data to geodatabase

- Perform address geocoding
- Produce maps, reports, and graphics
- Complete a predesigned GIS project in planning

TEXTBOOKS

Required texts: **Getting to Know ArcGIS, 4th edition**, by Michael Law and Amy Collins, ESRI Press, 2015. ISBN: 9781589483828

Optional texts: **A Primer of GIS: Fundamental Geographic and Cartographic Concepts**, by Francis Harvey, Guilford Press, 2008.

Making Maps: A Visual Guide to Map Design for GIS, 2nd edition, by J. Krygier and D. Wood. The Guilford Press, 2011.

The ESRI Guide to GIS Analysis: Geographic Patterns & Relationships, Vol.1, by Andy Mitchell. The ESRI Press, 2001.

COURSE REQUIREMENTS

There are five requirements for the class: (1) reading assignments, (2) lab exercises, (3) class assignments, (4) exams, and (5) class attendance and participation.

Readings: Reading is essential for learning. Reading assignments from the required and optional textbooks are included in the course schedule section. Students are expected to complete the reading assignments prior to each class session. Students are encouraged to read additional readings related to GIS.

Lab exercises: Besides lectures, there will be lab exercises throughout the sessions. Students are expected to complete lab exercises in class. The lab exercises cover the most frequently used techniques of GIS data management and spatial data analysis, and provide opportunities for students to gain hands-on experience with GIS functionalities.

Class assignments: In addition to lab exercises, there will be three class assignments that should be independently completed by students using the knowledge and techniques learned through lectures and lab exercises in class. Class assignments must be turned in on time (see class schedule for assignment due dates). Assignments turned in past the due dates will be penalized 10% for each week late. No assignment will be accepted after December 6, 2017.

Exams: There will be a mid-term and a final exam. The exams will include topics and techniques covered in readings, lectures, lab exercises, and class assignments. The purpose of the exams is to help students get familiar with the common terminologies of GIS, the primary functions of GIS, and some recurring issues in GIS applications.

Class Attendance: Regular class attendance is required. Lectures and lab exercises are sequential. They are built on skills gained in previous sessions. Students are required to attend all the lecture and lab sessions. Unless there is a legitimate reason, no excused absence will be granted. A written note from an authority (e.g. doctor, employer, *etc.*) will be required for any legitimate absence. Each unauthorized absence will result in a 3% deduction from your total weighted score. Please refer to university drop policy if students wish to drop out from the class.

GRADING POLICY

The course grading will be based on the following components:

1. Assignment #1	10%
2. Assignment #2	10%
3. Assignment #3	10%
4. Assignment #4	10%
5. Mid-term exam:	25%
6. Final exam:	35%

Total:	100%

LIBRARIAN TO CONTACTS

[Mitch Stepanovich](#) 817-272-2945 stepanovich@uta.edu

USEFUL INFORMATION ABOUT THE UT ARLINGTON LIBRARY

Library Home Page	<u>http://www.uta.edu/library</u>
Subject Guides	<u>http://libguides.uta.edu</u>
Subject Librarians	<u>http://www.uta.edu/library/help/subject-librarians.php</u>
GIS Data	<u>http://libguides.uta.edu/gis/datasources-us</u>
Course Reserve	<u>http://pulse.uta.edu/vwebv/enterCourseReserve.do</u>
Library Tutorials	<u>http://www.uta.edu/library/help/tutorials.php</u>
Connecting from Off- Campus	<u>http://libguides.uta.edu/offcampus</u>
Ask A Librarian	<u>http://ask.uta.edu</u>

OUTLINE OF COURSE CONTENTS, SCHEDULE, AND READING ASSIGNMENTS

Date	Topics	Readings	Exercises/Assignments
8/30	Course overview		
9/6	Introduction to GIS	Law & Collins, Chapter 1 Harvey, Chapter 1 Krygier and Wood, Chapter 1	Hands-on Exercise
9/13	ArcGIS Navigation	Law & Collins, Chapters 2~4	Hands-on Exercise
9/20	GIS Data Concepts & Management	Harvey, Chapters 2, and 6 Krygier and Wood, Chapter 3	Hands-on Exercise
9/27	Spatial Analysis	Law & Collins, Chapters 7 ~9 Harvey, Chapter 10, pp.193-207 Michell, Chapter 3 Krygier and Wood, Chapters 8 and 9	Hands-on Exercise
10/4	GIS Data Sources & Quality	Law & Collins, Chapters 14 and 17 Harvey, Chapters 7, 8, and 12	Assignment #1 Due
10/11	Mid-Term Exam		
10/18	GIS Data Errors, Correction, & Creation	Law & Collins, Chapters 11~13	Hands-on Exercise
10/25	Spatial Query	Law & Collins, Chapters 15 and 16 Michell, Chapter 5	Hands-on Exercise
11/1	Spatial Data Alignment	Law & Collins, Chapters 6 and 18 Harvey, Chapters 3, 4, and 5 Krygier and Wood, Chapter 5	Assignment #2 Due
11/8	Geoprocessing	Law & Collins, Chapter 19 Harvey, Chapter 9	Hands-on Exercise
11/15	Map Creation	Law & Collins, Chapter 10 Harvey, Chapters 10 (pp.207-217), 11, and 13 Krygier and Wood, Chapters 6, 7, 9 ~ 11	Hands-on Exercise
11/22	GIS & ICT	Law & Collins, Chapter 5	Hands-on Exercise
11/29	Review		Assignment #3 Due
12/6	Final Exam		Assignment #4 Due

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course.

ADDENDUM TO COURSE SYLLABUS

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Title IX Policy: The University of Texas at Arlington ("University") is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.*

Academic Integrity: Students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from

other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include [tutoring](#), [major-based learning centers](#), developmental education, [advising and mentoring](#), personal counseling, and [federally funded programs](#). For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at <http://www.uta.edu/universitycollege/resources/index.php>.

The IDEAS Center (2nd Floor of Central Library) offers **free** tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email IDEAS@uta.edu or call (817) 272-6593.

The English Writing Center (411LIBR): [Optional.] The Writing Center Offers free tutoring in 20-, 40-, or 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Our hours are 9 am to 8 pm Mon.-Thurs., 9 am-3 pm Fri. and Noon-6 pm Sat. and Sun. Register and make appointments online at <http://uta.mywconline.com>. Classroom Visits, workshops, and specialized services for graduate students are also available. Please see www.uta.edu/owl for detailed information on all our programs and services.

The Library's 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation. <http://library.uta.edu/academic-plaza>

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as “lecture,” “seminar,” or “laboratory” shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.