GEOL 4331/ 5321 Analysis of Spatial Data

Fall 2014/ Lee

Online – no class room

Instructor	**Dr. Junhak Lee**
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Office phone	817-272-9365
Office hours	Monday 4:00 pm – 6:00 pm; by appointment

Course Description

ModelBuilder, Python scripting (for students who have no programing experience), analyzing spatial data using ArcGIS, Spatial Analyst, 3D Analyst, topological surface analysis, spatial modeling, 3-d visualization, spatial statistics. Prerequisite: Geol 4330. Students who successfully complete the course are able to establish a foundation for spatial problem solving and GIS analysis for their academic research and professional careers.

Textbooks

[Required]

- There is no required text book for this class. We will mainly use ESRI on-line manuals and various on-line materials

[Recommended]

- GIS Fundamentals: A First Text on Geographic Information Systems by Paul Bolstad (ISBN: 978-0971764736)

Software

- ArcGIS 10.1 (or higher) is required
    - If you do not have the program, you can make a request for the license to the instructor
    - You can use ArcGIS at libraries and labs in UTA
        - Architecture & Fine Arts Library
        - Architecture Building Computer Lab
        - Science & Engineering Library
        - University Hall Computer Lab
        - Central Library (All computers on 2nd, 3rd, 4th, and 5th floors)

- Python: ArcGIS comes with Python so that you do not have to install it separately.

- MS-Word is required for submitting lab assignments in “docx(or doc)” file format. Other free-software (Google Docs, OpenOffice, LibreOffice, etc) can be used.

Requirements & Grading

Grades will reflect class quizzes (based on readings), lab exercises, mid-term and final exams. Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels.

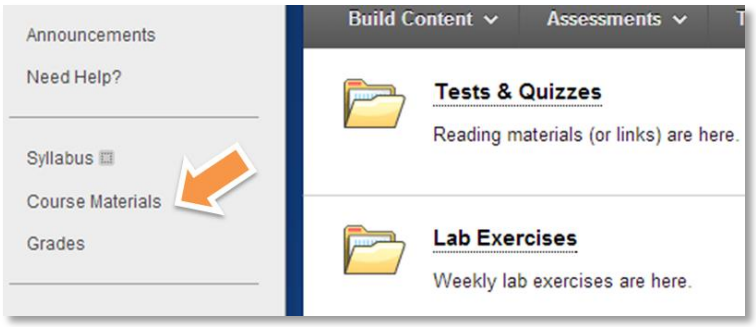
1. Reading & Quiz (30%)
2. Lab exercises (40%)
3. Class project (10%)
4. Midterm & Final Exams (20%)

*Important note: **Incomplete grading "I" or extensions are not available in this class** unless severe illness or documented extenuating circumstances justify it.

- **Reading & Quizzes:** Students are expected to read class materials (the reading materials (from the book or Internet links) will be available on Blackboard). Each week, there will be a set of quizzes about the reading materials. The due for the quiz will be posted on Blackboard. There will be penalties for the late submission (10% per day)
- **Lab assignment:** There will be 10 lab assignments. Students can work together but assignment should be submitted separately (and note the name of student working with) to Blackboard. Please keep the due date (listed in schedule table) and there will be penalties for the late submission (10% per day). No assignment will be graded after 12/2/2014
- **Class project:** Each student will select a topic of personal interests. A draft for the topic is required to be submitted by 10/22. The final report need to include motivation, objectives, data sources, methods, and results (and discussion). The length of the report does not matter if you have enough information about your work. The due for the final project is 11:59 pm on 12/2/2014 (in a computer file, no hardcopy). All student projects will be posted on a public accessible website (please do not copy and paste someone else's work).
- **Exams:** There will be a mid-term and a final exam. The exams will include topics covered in readings and lab exercises. Unlike the quiz, there will be time limit for the exam (2 hour). There will be review sessions before the exam. The questions will be in random order and you cannot go back to the previous questions.

Blackboard

All readings, quizzes, lab assignments, and exams will be posted on Blackboard. Click on "Course Materials"



Schedule

Date	Topic	Lab assignment	Due (9:00 PM)
8/27	Class Overview	Warming up	9/2
9/3	Review of basic GIS	TBA	9/9
9/10	Introduction to Model Builder	ESRI ModelBulider Tutorial #1 and #2	9/16
9/17	Python Basic	Python Tutorial ("After Hours Programming")	9/23
9/24	Python and Geoprocessing	Extending ArcGIS with Python	9/30
10/1	Spatial Analysis - Modeling and solving spatial problem	Spatial Analyst Tutorial Ex #1, Ex #2, Ex #3a	10/7
10/8	Spatial Analysis - Map Algebra, raster calculation	Spatial Analyst Tutorial Ex #3b, Ex #4	10/14
10/15	Mid-Term		
10/22	3D Analysis - 3D features and surfaces	3D Analysis Tutorial Ex #1, Ex #2, Ex #3	10/28
10/29	3D Analysis - Visualizing 3D data and Analysis in 3D	3D Analysis Tutorial Ex #4, Ex #5, Ex #8	11/4
11/5	3D Analysis - LiDAR data processing	LiDAR solution in GIS - Guidebook	11/11

11/12	Geostatistical Analysis	Geostatistical Analysis Tutorial	11/18
11/19	Class project	Class project	12/2
11/26	Thanksgiving Holidays		
12/3	Final review		
12/8-10	Final		

***** *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.*

Other General Notes

Attendance Policy: At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this course, I have established the attendance policy described on page 2. Students have the responsibility to fully participate. This participation includes, but is not exclusive to, attendance, class discussions, the individual evaluating and sharing of research that is relevant to their own future career interest as it relates to sustainable communities, and preparing for and participating in team presentations. As a rule, undergraduate students should expect to spend three to four hours preparing for each hour spent in class (i.e. for a three hour class each week, 9 to 12 hours of preparation).If a student does miss a class, they need to contact the instructor ASAP to determine what, if any impact there is to his/her final grade.

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://wweb.uta.edu/ses/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: The University of Texas at Arlington is committed to upholding U.S. Federal Law "Title IX" such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

Academic Integrity: All 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.

Instructors 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 www.uta.edu/resources.

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 a 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, which is located. 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.