

**GRG470C – Advanced GIS**

**Spring 2013**

**Hard Pre-Requisite: GRG360 or equivalent.**

<b>Lecture</b>	<b>MWF</b>	<b>3:00- 4:00 pm</b>	<b>CLA 1.102</b>	
<b>Labs</b>	<b>M</b>	<b>11:00 - 12:30</b>	<b>CLA 1.402</b>	<b>Unique #: 37565</b>
	<b>W</b>	<b>11:00 – 12:30</b>	<b>CLA 1.402</b>	<b>Unique #: 37570</b>

**Instructor:** Dr. Eugenio Arima

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**Office Hours:** Tu, Th 3:00 – 4:00 pm or by appointment

**TA:** Mr. Edward Park

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**Office Hours:** TBD

1. **Course description:** Geographic Information Systems (GIS) modeling capabilities have been used to inform and support decision making in the management of watersheds and parks, in the design of emergency evacuation plans, among others. Advanced GIS will cover a wide range of modeling applications using rasters, including watershed drainage analysis, ecological corridors and least cost path analysis. Students will also be introduced to analytical tools such as spatial data interpolation techniques, point pattern and density analysis, and error assessment. Hands-on experience will be provided through weekly labs and final project.
2. **Course goals are to:** a) expand and refine GIS concepts, applications, and analysis beyond the introductory GIS course. You will be exposed to a) modeling with raster data; b) basic concepts of geostatistical analysis; and c) computer based visualization tools.
3. **Course structure:** the course will be presented in lecture and lab format. You are expected to attend classes and labs and to read the assigned material.
4. **Blackboard:** Information such as syllabus and schedule will be posted on BLACKBOARD.
5. **Textbooks:**

**Recommended:** Wilson, J. P and Gallant, J. C. 2000. *Terrain Analysis: Principles and Applications*. John Wiley & Sons, Inc. ISBN 0-471-32188-5.

**Reading Assignment:** journal articles will be assigned during the semester and you are expected to read them and **come prepared** to discuss in class.

6. **Equipment REQUIRED:** The College of Liberal Arts and the Department of Geography will NO LONGER offer disk space in our servers for this class. Thus, you will have to save all your work to your own portable device such as a **flash drive**. A flash drive of 8GB (it's now below \$10) should be more than enough to store all your files for the course. Do not leave anything in the lab computer C drive because all your work will be erased upon logoff.

7. **Assessment:** grading will be based on a combination of labs, exams, and a final project, according to the following percentage:  
Labs: 40%  
Exams: 20% (2 exams, 10% each)  
Final Project: 30% (5% pre-proposal, 5% powerpoint presentation, 20% GIS analysis content)  
Participation: 10% (mostly from readings' discussions)

Letter grades will be calculated as follows: A (94-100%), A<sup>-</sup> (90-93.9%), B<sup>+</sup> (86-89.9%), B (82-85.9%), B<sup>-</sup> (78-81.9%), C<sup>+</sup> (74-77.9%), C (70-73.9%), C<sup>-</sup> (66-69.9%), D<sup>+</sup> (62-65.9%), D (58-61.9%), D<sup>-</sup> (54-57.9%), F below 54%. There will be no "rounding up" of grades.

8. **Make-up policy:** due dates are firm. Make-up exams require a written excuse of serious illness, a family emergency, or other extenuating circumstances. I will **deduct** points for labs, assignments, and project turned in late.
9. **Final Project:** you should use the GIS-based techniques you learned in class to **answer a spatial** question of your interest anywhere on Earth and beyond (Mars, Venus, Moon). You can use existing datasets or create your own data but the most important is the ability to use GIS analytical tools to answer your question. Please come to my office hours to discuss your final project as early in the semester as possible. The final project will be in groups of two-three students.
10. **Make-up policy:** due dates are firm. Make-up exams will require a documented excuse for serious illness, a family emergency, or other extenuating circumstances. I will deduct points for labs, assignments, and projects turned in late.
11. **Decorum:** use of any portable device (laptops, cellphones, iPads, iPods, etc...) **will not be allowed during lectures and labs.** Avoid arriving late to class/labs or leaving early. Be as courteous as you would be in a professional setting.
12. **Academic Integrity:** *"The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect towards peers and community."*  
(<http://deanofstudents.utexas.edu/sjs/downloads/InstitutionalRules1011.pdf>). Plagiarizing, cheating, copying or photocopying someone else's work is a violation of the University of Texas principles of academic integrity and will result in course failure and referral to your Dean for further disciplinary actions.
13. **Documented Disability Statement** *"Students with disabilities who require special accommodations need to get a letter that documents the disability from the Services for Students with Disabilities area of the Office of the Dean of Students (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time. Five business days before an exam the student should remind the instructor of any testing accommodations that will be needed. See website below for more information: <http://deanofstudents.utexas.edu/ssd/providing.php>"*
14. **Religious holydays** *"sometimes conflict with class and examination schedules. If you miss an examination, work assignment, or other project due to the observance of a religious holiday*

*you will be given an opportunity to complete the work missed within a reasonable time after the absence. It is the policy of The University of Texas at Austin that you must notify each of your instructors at least fourteen days prior to the classes scheduled on dates you will be absent to observe a religious holyday.”*

15. **A final note:** we should have a fun and productive semester. If things are not progressing the way you wish during the semester, please let the instructor know either directly or anonymously so issues may be dealt with as soon as possible.

**16. TENTATIVE Schedule (Subject to Change)**

<b>DATE</b>	<b>Topic</b>	<b>Assignment Due</b>
Week 1 Jan 14 - Jan 18	Introduction to the course Review of Projections and Coordinate Systems. No Labs this week	
Week 2 Jan 21 – Jan 25	Raster Interpolation	
Week 3 Jan 28 – Feb 1	Raster Interpolation	Lab 1 report
Week 4 Feb 4 - Feb 8	Terrain Analysis – first and second derivatives	Lab 2 report
Week 5 Feb 11 - 15	Hydrologic modeling	Lab 3 report
Week 6 Feb 18 – Feb 22	Hydrologic modeling	Lab 4 report
Week 7 Feb 25 – Mar 1	Viewshed analysis	Lab 5 report
Week 8 Mar 4 – 8	Least cost path analysis	<b>EXAM 1 on Mar 8.</b>
Week 9 Mar 11 – 15	SPRING BREAK	
Week 10 Mar 18 – Mar 22	Corridor analysis & Land Cover Change	Lab 6 report
Week 11 Mar 25 – 29	Fuzzy set multicriteria evaluation	Lab 7 report <b>Pre-proposal due on Mar 29</b>
Week 12 Apr 1 – 5	Fuzzy set multicriteria evaluation	Lab 8 report
Week 13 Apr 8 –12	AAG Meeting No lectures on W, F	Lab 9 report
Week 14 Apr 15 - 19	Network Analysis Location and Allocation Models	
Week 15 Apr 22 – Apr 26	Catching UP	<b>EXAM 2 on APR 26</b> Lab 10 report
Week 16 Apr 29 – May 3	Projects	
Final Project Presentations	<b>Wednesday, May 8, 7:00-10:00 pm</b>	