

**GRG 360G – Environmental Geographic Information Systems  
Spring 2012**

<b>Lectures:</b>	<b>TTh 12:30 - 2:00 pm</b>	<b>GRG102</b>	
<b>Labs:</b>	<b>M: 9:00 – 11:00 am</b>	<b>GRG206</b>	<b>Unique #: 37390</b>
	<b>W: 9:00 – 11:00 am</b>	<b>GRG206</b>	<b>Unique #: 37395</b>
	<b>M: 1:00 – 3:00 pm</b>	<b>GRG206</b>	<b>Unique #: 37400</b>
	<b>W: 1:00 – 3:00 pm</b>	<b>GRG206</b>	<b>Unique #: 37405</b>

**Instructor:** Dr. Eugenio Arima

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**Teaching Assistants:**

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- 1. Course description:** Geographic Information Systems (GIS) has been used in a multitude of environmental applications because it aids in the collection, storage, analysis, and visualization of spatial information and it helps users to make informed decisions regarding the use, management, and protection of the environment. This course will cover the theory of GIS with hands-on experience in a multitude of environmental applications including: geographical data entry and acquisition, data conversion, database query and site selection, vector and raster modeling, and integration with global positioning system (GPS).
- 2. Course goals are to:** a) create competency in GIS and GPS technology, b) instill curiosity and appreciation for the richness and potential of geographical information to understand, analyze, and solve environmental problems, and c) improve your ‘spatial reasoning’ skills more generally.
- 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. Lecture notes and Powerpoint slides WILL NOT be posted on Blackboard, with a few exceptions.
- 4. Blackboard:** Information such as syllabus and schedule will be posted on BLACKBOARD. It is your responsibility to check it regularly.

## 5. Textbooks:

### Required:

Longley, P, M. Goodchild, D. Maguire, D. Rhind. 2011. Geographic Information Systems & Science. 3<sup>rd</sup> Edition. John Wiley & Sons, Inc. ISBN: 978-0-470-72144-5

Lab book: Ormsby, T., E. Napoleon, R. Burke, C. Groessl, and L. Feaster. 2004. Getting to know ArcGIS desktop **Updated for ArcGIS 10**. 2<sup>nd</sup> Edition. Readlands, CA: ESRI Press. ISBN: 9781589482609.

### Recommended:

Any book on cartography, such as:

Slocum, Terry A. Thematic Cartography and Geographic Visualization, Second Edition. Prentice Hall. ISBN: 9780130351234

Robinson, Arthur H. Elements of Cartography. Willey. ISBN: 978-0-471-55579-7

### 6. Assessment: grading will be based on a combination of labs, assignments, a portfolio, exams, and a final project, according to the following percentage:

Labs: 50% (two labs will be worth 30% of your grade)

Assignments: 10% (two assignments 5% each)

GIS Portfolio: 15%

\*Exams: 30% (two exams 15% each)

Homework assignments: we will not have time to do all chapters from Ormsby et al. during our labs. You will be asked to do a few chapters on your own. These particular chapters will not be graded BUT will potentially be part of the lab practical exams (see item 7 below).

\*Graduate students are required to do a GIS final project, prepare a powerpoint presentation, and present it to the class in our last week of classes. Graduate students' exams will be worth 20% of the final grade and the final project 10%.

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.

7. **Labs** must be submitted through Blackboard and are due a day before your next week's lab (except lab practical exams, which are due at the end of the lab). Two labs will contain very little instructions and will serve as "lab practical exams" and thus will be weighted more heavily (15% each). You can consult your books, notes, online sources but the work **MUST** be individual (fyi, it is very easy to figure out if someone copied GIS work from another person).

8. **GIS Portfolio:** see attached instructions.

9. **Exams** will be in-class and everything discussed or presented in class and labs or assigned can potentially be on the exams. That includes lectures, book chapters, labs, homework assignments, etc.

10. **Assignments** will be similar to a regular lab although fewer instructions will be provided. The objective of the assignment is to reinforce important practical GIS concepts and to measure your ability to do GIS independently.
11. **Final Project (for graduate students only)** should use GIS to **answer a spatial** question (where, how far, what is the area, volume, overlay, spatial pattern, spatial relationship) 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.
12. **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.
13. **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.
14. **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.
15. **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>”*
16. **Religious holidays** *“sometimes conflict with class and examination schedules. If you miss an examination, work assignment, or other project due to the observance of a religious holyday 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.”*
17. **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.

Be an ACTIVE LEARNER

- This will be an “advanced” intro GIS class. On average, students spend 3-4 hours per week outside lab/lecture to complete assignments.
- The only way to learn is to explore

I will be happy to help you advance your skills!

### 18. Important Dates

Lab practical #1: March 5 and March 7  
 Mid-term Exam: March 8, in class.  
 Lab practical #2: April 30 and May 2<sup>nd</sup>.  
**Final Exam: Thursday May 10, 9:00 - 12 noon, in class.**

### 19. TENTATIVE SCHEDULE (SUBJECT TO CHANGE)

Date	Topic	Reading	Assignment Due
Week 1	Introduction to the course	Longley Chapter 1	
Jan 17 – Jan 19	GIS basics	Ormsby Chp 1, 2	
	Lab: No labs on M, W.		
Week 2	Data models	Longley Chapter 3	
Jan 23 – Jan 26	Lab1: Intro to ArcGIS Ormsby 3, 4		
Week 3	Data sources & data types	Longley Chapter 8	
Jan 30 – Feb 2	Lab 2: Digitizing, Ormsby 15, 16		
Week 4	Projections & coordinate systems	Longley Chapter 5	
Feb 6 - Feb 9	Lab 3: Ormsby 13	Online sources	
	Do also Ormsby 5 (symbolization)		
Week 5	Projections and coordinate systems	Longley Chapter 5	
Feb 13 - 16	Lab 4: More on projections	Online sources	
Week 6	Data structure, data attributes	Longley Chapter 10	
Feb 20 – Feb 23	Lab 5: Query, joining & relating tables		HW Georeferencing
	Ormsby 8, 9		
Week 7	No lecture on Feb 18 – AAG Meeting	Online sources	Assignment 1 due on Mar 2 <sup>nd</sup>
Feb 27 – Mar 1	No labs on M, W		
Week 8	GPS	Online sources	
Mar 5 – Mar 8	Lab 6: Lab practical #1 (M, W)		Lab practical #1 (M, W)
			Exam #1 on Mar 8, in class.

Date	Topic	Reading	Assignment Due
Week 9	SPRING BREAK		
Mar 12 – Mar 15			
Week 10	GPS & Error Correction	Longley Chapter 6	
Mar 19 – Mar 22	Lab 7: GPS data collection & analysis		
Week 11	Overview of spatial analysis	Longley Chapter 14	
Mar 26 – Mar 29	Lab 8: Analyzing spatial data		
	Ormsby 6, 10, 11		
Week 12	Vector Analysis	Longley Chapter 15	
Apr 2 – Apr 5	Lab 9: Site suitability analysis		HW: Ormsby 20
Week 13	Spatial Modeling with Rasters		Assignment 2 due on Apr 13 <sup>th</sup> .
Apr 9 – Apr 12	Lab 10: Suitability Analysis with Rasters	Longley Chapter 14, 15	
Week 14	Basic cartography	Longley Chapter 12	
Apr 16 – Apr 19	Lab 11: Making maps for presentation		
	Ormsby 18, 19, 7		
Week 15	Basic cartography	Online sources	
Apr 23 – Apr 26	Lab 12: Cartographic Competition		
Week 16	Metadata, Wrapping up	Longley 11.1, 11.2	Lab practical #2 (M, W)
Apr 30 – May 3	Lab 13: practical #2 (in lab)		
<b>Final EXAM</b>	<b>May 10, Th 9:00 - 12 noon, in class.</b>		