Geography 441/581: Course Syllabus

Instructor Contact Information	TA Contact Information
Dr. Michael N. DeMers Office: Breland 118 Phone: (575) 496-5231 Skype: akadrgadget Gmail: demers01@gmail.com Second Life Name: Gadget Loon Office Hours: 8:30-9:30 MWF; 1:30-3:30 MW	

Course Introduction and Overview

Geography 441/581 is an **ADVANCED** course that examines how to design geographic information systems within organizations. Based on the survey results this course will begin with a study of Map Algebra first and will then proceed to the topic at hand. While Map Algebra might seem a bit off topic, it has it's place because as system designers it is important to know what the capabilities of GIS are before you design applications for institutions. This will likely be the last time I will offer this information in this course.

Whenever practical we will perform our institutional design within the context of the Valles Caldera geodatabase and supporting design documentation. This makes this course mostly problem based than traditionally lecture / laboratory although we will use that format to guide our learning. Moreover, if possible, we are going to experiment with the use of multi-user virtual environments to interact with important staff members of the Valles Caldera Preserve to add another level of realism to the design process. Because our results could serve the Preserve staff, this type of learning is often called Service-Based Learning.

This course covers the following aspects of map algebra and institutional design:

1. Map Algebra (plus Spatial Analyst - TBD)
2. Design Basics
3. Analyzing Business Needs
4. Describing Information Products
5. Master Input Data List
6. Conceptual Data Design
7. Conceptual Technology Design
8. Organization Cooperation & Security Review
9. Benefit / Cost Analysis
10. Risk Analysis
11. Review & Procurement Planning
12. Benchmarking

Course Experiences:

Through a set of topically-focused lectures, and linked exercises and discussions, delivered through the blackboard discussion and assignment tools you will be given an opportunity to perform virtually all of the tasks necessary to design a GIS (a complete geographic information system, not just the data) that will allow the GIS to become integral to the operations of organizations adopting the technology. The exercises are designed to be collaborative so that you are not expected to do these in isolation, but rather to discuss things with each other and share information to learn from each other. This approach is meant to simulate a real-world setting, which includes collaboration. In many cases we will try to use the Valles Caldera database and supporting documentation as a re-world regionally important GIS situation. If/when possible we will try to bring in the Valles Caldera personnel to assist us during the process.

Your Instructor

I have a BSEd (Earth Science / Biology - University of North Dakota 1974), MS (Geography - University of North Dakota 1980), MPhil (Geography - University of Kansas 1983), PhD (Geography - University of Kansas 1985), and a Graduate Certificate of Online Teaching and Learning (New Mexico State University 2007). I've taught junior high school (Milbank, South Dakota), high school (Cavalier, North Dakota), and university (Mankato State, North Texas State, Ohio State, NMSU). I write textbooks (as you might know if you look at your course text), and other educational materials (e.g. GIS for Dummies). My research interests include GIS applications, GIS design, and GIS education.

Beyond my professional activities I do have a life. Well, ok, not much of a life but some. I love to go for long walks that help me think, enjoy visiting natural settings like Dripping Springs, City of Rocks, and White Sands National Monument (all within easy driving distance). I have always loved working with my hands and still enjoy the occasional few hours working on scale models. My particular interest in model-building include historic ship models (both sail era and WWII) and, more recently, riverboats. I love to read, especially horror novels from Stephen King and Dean Koontz. My favorite pastime is watching DVD movies, especially comedies, and older films from the 1960s. I often use these movies to develop ideas that I use in my teaching. My personal life is pretty simple. I'm married now 25 years to Dolores, who is an awesome real estate agent with RE/MAX Classic (had to put in the plug). I love my home and spend as much time as I can there. I listen to rock and roll and classical and enjoy other forms a bit as well. In general I'm pretty easy going, fair, demanding (of myself as well as of my students), and have a passion for learning. I hope that rubs off on you.

A final exercise, which you should begin working on from the start of the course is to develop an e-portfolio of accomplishments and capabilities that you can use to obtain employment. In previous courses (e.g. 481 and/or 487) you had fairly tight constraints as to how you wanted to do this. In this course you, as a class, will design the format or formats as well as the grading rubric for this 200 point exercise. This will allow you to take ownership both of the exercise and of its assessment.

Course Objectives

As the course precedes you will be provided with specific course learning objectives and behavioral outcomes and associated rubrics. These will be developed to ensure you gain the following abilities.

1. A working capability with the Spatial Analyst tool.
2. Enumerate SIP's, applications, and appraise design documents
3. Anayze business needs and develop a technology seminar
4. Create a complete description of information products
5. Create a prioritized master input data list
6. Demonstrate the relationship among scale, minimum mapping unit, and error tolerance as they apply to database development
7. Estimate the technology lifecycle of a sample GIS operation
8. Define a system interface and communication requirements for a real GIS operation
9. Prepare a list of organizational cooperators
10. Perform a security review

11. Perform a benefit-cost analysis for a GIS operation
12. Develop procurement and reporting procedures for a GIS implementation

Required and Recommended Reading

Texbooks

The following text is required for the course:

Tomlinson, Roger F. (2007). Thinking about GIS: Geographic information systems planning for managers. Redlands, CA, ESRI Press.

The following text is recommended for the course (and not in the bookstore)

McGuire, David; Kouyoumajan, Victoria, and Smith, Ross (2008). The business benefits of GIS: an ROI approach. Redlands, CA, ESRI Press.

Lab Materials: Via pdf on your LMS

Valles Caldera Databases

Valles Caldera Design materials.

Prerequisites:

Geography 481 or Graduate Standing and evidence of ArcGIS experience (e.g. ESRI certificate, previous coursework, job experience).

Topical Coverage (approximate timing)

Academic Weeks	Topic (Text Chapters)	Laboratories
1	Introduction / profiles / getting started on Spatial Analyst	ESRI course: Spatial Analyst (100 points for certificate)
2	Map Algebra I	Continue ESRI Course
3	Map Algebra II	Continue ESRI Course
4	Introduction to GIS Design Planning	GIS Design Basics
5	Analyzing Business Needs	Analyzing Business Needs
6	Describing Information Products	Describing Information Products
7	Master Input Data List	Master Input Data List
8	Conceptual Data Design	Conceptual Data Design
9	N/A	… continue Conceptual Data Design (due March 19 at midnight)
10	Conceptual Technology Design	Conceptual Technology Design
11	Preparation of Implementation: Organization Cooperation & Security Review	Preparation of Implementation: Organization Cooperation & Security Review
12	Benefit / Cost Analysis & Risk analysis	Benefit / Cost Analysis & Risk analysis
13	Review and Procurement Planning	Review and Procurement Planning & Benchmarking
14	Wrap-up	Wrap-up / work on portfolio
15	Final Discussion / Course Review	Turn in Portfolio

Assessment

Undergraduate Assessment (441):

This course has two (2) forms of assignment. (**1**). 10-100 point exercises (blackboard discussions & assignments), and (**2**) 1-200 point design e-Portfolio.

I try to provide feedback and grades for assignments ten days from the time they are provided. There are occasional extenuating circumstances where this goal cannot be met I will put forth every effort to maintain that schedule.

Assignment	Points	Number	Total Points
e-Portfolio	200	1	200
Lab Exercises	100	10	1000
TOTAL			1200

 Grading Rubrics are different for each exercise. Please refer to them for details. Laboratories, e-Portfolio, and Presentation Rubrics are posted separately on the course menu.

Final grades will be based on a method called Natural Breaks whereby students tend to cluster along a graph. Still, students always as for a target, so here are the targets to receive grades in this course.

A – 95% (1140 points)
B – 90% (1080 points)
C – 80% (960 points)
D – 70% (840 points)

Graduate Assessment (581):

This course has two (3) forms of assignment. (**1**). 10-100 point exercises (blackboard discussions & assignments), (**2**) 1-200 point design e-Portfolio, (**3**) 1-200 point Valles Caldera Design Project.

I try to provide feedback and grades for assignments ten days from the time they are provided. There are occasional extenuating circumstances where this goal cannot be met I will put forth every effort to maintain that schedule.

Assignment	Points	Number	Total Points
e-Portfolio	200	1	200
Lab Exercises	100	10	1000
Project (581 Students)	200	1	200
TOTAL			1400

Grading Rubrics are different for each exercise. Please refer to them for details. Laboratories, e-Portfolio, and Presentation Rubrics are posted separately on the course menu.

Final grades will be based on a method called Natural Breaks whereby students tend to cluster along a graph. Still, students always as for a target, so here are the targets to receive grades in this course.

A – 95% (1330 points)
B – 90% (1260 points)
C – 80% (1120 points)
D – 70% (980 points)

Assignment Schedule:

Assignments will be assigned using the assignment tool, which will indicate the due date. Individual parts of the assignments will be specifically noted in the assignment.

Late assignments:

In general, assignments will be assessed a 10% grade reduction if not turned in on time. No assignments will be accepted beyond one week after the due date. NOTE: If you have an illness or extraordinary circumstances that affect your ability to turn in assignments on time you are advised to contact your instructor (or laboratory TA) to ask for dispensation from these rules.

Exceptions to this policy are at the discretion of the instructor and may be made for certain circumstances (e.g. bereavement, illness, university sponsored events, etc.), but

you must contact the instructors to make arrangements before the assignment is late. We will make exceptions to the prior arrangements requirement in the event of tragic events such as car accidents, a major family emergency, etc. Again, this is at the instructor's discretion.

Rules of Conduct

Plagiarism and cheating on exams, quizzes, etc. are serious breaches of trust and come with often devastating circumstance. Please refer to the discussion of plagiarism in the student handbook for more information.

Http://www.nmsu.edu/~vpsa/SCOC/misconduct.html

Students with Disabilities

If you have or believe you have a learning disability, you are free to self-identify. You can do so by providing documentation to the Office for Services for Students with Disabilities , located at Garcia Annex (telephone: 646-6840). Appropriate accommodations can then be provided for you. If you have a condition which may affect your ability to exit safely from the premises (e.g. Breland 192) in an emergency or which may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or the director of Disabled Student Programs. If you have general questions about the Americans with Disabilities Act (ADA) call 646-3333.