Advanced Geographic Information Systems (GIS)

Course Times: Tues 6:00 PM – 9:40 PM (Jan 7th – March 25th) Location: KCI

Instructor: Alan Rich  email: acr8057@tiptoe.fhda.edu

Office: Building 5999 (Temporary Village)  Phone: (650) 949-7999 x4286

Office Hours, Winter 2003: - Tues 5 - 6:00 PM (Jan 7th – March 25th)

This is an advanced level course in Geographic Information Systems (GIS). It will build on the techniques learned in the Introduction to Geographic Information Systems (GIS) course by exposing the student to more advanced methods in developing and utilizing GIS data.

At the completion of this course, the student should be able to do the following:

1. Plan and execute a successful GIS project using multiple data sources
2. Collect and input spatial data using a variety of different methods
3. Use a Global Positioning System (GPS) for collecting field GIS data
4. Understand digitizing and scanning as tools for data acquisition
5. Geo-reference aerial photographs to their true coordinates
6. Query and manipulate GIS data using database techniques
7. Identify and solve common problems found in a GIS project
8. Exchange data between different GIS systems

Prerequisites

Completion of the Introduction to Geographic Information Systems (GIS) course (Geography 12) or equivalent.

Texts

Required: An Introduction to Geographical Information Systems
Course Outline

Section 1: Building a GIS Project – Planning, Design, and Data Capture

- GIS Project Planning Basics
- Database Design
- Data Capture Techniques
- Using GPS Equipment

Section 2: Refinement of a GIS Project

- Identifying and Correcting Errors in the Geometry and Attributes
- Presentation Techniques

Section 3: Advanced GIS Techniques

- Applying Design and Implementation techniques to a new GIS project
- Geo-referencing an aerial photograph using field collected reference points
- Exchanging GIS data between software systems
- Advanced GIS problem solving

Required Materials

Students will need to bring one Zip disk to each class and lab. This will be used to save their work. Because of the volume of data used, it is advisable that the students have 2 or more Zip disks.

Classroom and Laboratory Teaching Methodology

This course will utilize a variety of teaching methods including lectures, discussion groups, student presentations, lab assignments, reading assignments, and two exams. The student will be expected to participate in classroom activities and to utilize lessons learned to solve lab based assignments.

The final grade for the course will be determined using the following point system:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Classroom Participation</td>
<td>100</td>
</tr>
<tr>
<td>Lab Projects</td>
<td>300</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>150</td>
</tr>
<tr>
<td>Final Exam</td>
<td>250</td>
</tr>
<tr>
<td>Student Project</td>
<td>200</td>
</tr>
<tr>
<td><strong>Total Possible</strong></td>
<td><strong>1000</strong></td>
</tr>
</tbody>
</table>

1000 – 900 points = A
899 – 800 points = B
799 – 700 points = C
699 – 600 points = D
Less than 600 points = F
Class Participation

Class participation will be graded on attendance, participation in discussion groups, giving oral presentations of published articles, and presentation of a final project.

Discussion groups will be formed in class to address issues presented by the instructor. Students will be expected to actively participate in the discussion groups.

Each student will be required to present a 3-5 minute presentation summarizing selected articles from GIS related periodicals. The student will also be required to present a 5-10 minute presentation discussing their student project. Students will be expected to use Microsoft PowerPoint for their presentations.

Class Attendance and Late Policy

Students are expected to arrive on time and be in class during class hours. If students are going to miss a class, they must notify the instructor in advance by telephone or email. Failure to do so will result in the loss of points. Students that are late repeatedly will also lose points.

All work in the lab will be completed by 9:40 PM on class nights. Students still present in the lab after this time will be subject to a loss of points.

Lab Projects

There will be six laboratory homework assignments designed to reinforce lessons learned in class. Time will be dedicated in class to work on the labs, but the student may need to spend additional time outside of class to complete the assignments. Labs must be completed in the KCI or BSS Division Computer Laboratory (Room 3101). Please check the appropriate schedules or with staff for when these labs are available.

The projects will focus on applying practical applications of lecture topics. Unless otherwise directed by the instructor, students may select one of the GIS software packages provided in the lab to complete their assignments. Students will be encouraged to work in pairs or in small groups, but must turn in original individual lab write-ups.

All assignments are due at the beginning of class on the posted due date. Assignments collected after the beginning of class will be considered late and penalized accordingly. Late work will be penalized 50% if received after the due date and time. Late work will not be accepted after the start of the next class following the due date.

Make-up Exam Policy

Make-up exams will only be given under the following circumstances: acute illness, family emergency, auto accident, or work crisis. Students may be asked to provide proof of circumstance.

All make-up exams must be scheduled on or before the day of the missed exam. The instructor must be notified by voice mail or email before the exam. Failure to do so will result in the failure of the exam.

Course Attendance and Materials

The student is responsible for all material presented and announcements made in class. Students are also responsible for all material on web sites that they are asked to review by the instructor.

Withdrawal Policy

The withdrawal policy is in accordance with the official Foothill College withdrawal policy. Please see http://socrates.fhda.edu/reg/todrop.html for more details.
**Plagiarism Policy**

Plagiarism on any assignment or exam will result in an F for the first infraction. An F for the course will result for any subsequent infractions. All incidents of plagiarism will be reported to the Dean of Students. For a description of plagiarism, please see the Foothill College definition at: [http://www.foothill.fhda.edu/news/honor.html](http://www.foothill.fhda.edu/news/honor.html).

**Student Agreement**

Students are required to read, sign, and return the attached student agreement to the instructor before the start of the 2\textsuperscript{nd} class. Failure to do so will result in lost points or being dropped from the class.

**Disclaimer**

The instructor reserves the right to modify or amend the schedule and procedures in the event of extenuating circumstances.
Advanced GIS Course - Student Agreement

As a student in the Advanced GIS Course, I agree to the following course policies and procedures:

1. I am responsible for all material presented in class.
2. I am responsible for all material in the assigned readings and for additional readings that are distributed in class.
3. I am responsible for material presented in web sites assigned by the instructor.
4. I understand that if I am going to be absent from class, it is my responsibility to notify the instructor in advance. It is also my responsibility to obtain any material that was distributed in class.
5. I understand that grading for the course will be based on the following point system:

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799 – 700 Points = C
699 – 600 Points = D
Less than 600 Points = F

6. I understand that 10% of the course grade is based on class participation. I agree that I must attend class and participate in class discussions and projects to earn these points. I also understand that being late will result in the loss of points.

7. I agree to turn my cell phone and pager off during class. If I fail to, I understand that I may lose class participation points for the week. I understand that repeated violations of this policy will result in my expulsion from the class.

8. I understand that make-up exams will only be given for the following circumstances: acute illness, family emergency, auto accident, or work crisis. Students may be asked to provide proof of circumstance. All make-up exams must be scheduled on or before the day of the missed exam. The instructor must be notified by voice mail or email before the exam. Failure to do so will result in the failure of the exam.

9. I agree that all assignments will be due at the beginning of class. I also agree that assignments collected after the start of class will be considered late and penalized accordingly. I understand that late work will be penalized 50% if not received before the start of class on the due date. I also understand that late work will not be accepted after the start of the next class.

10. I agree to the terms of the official Foothill College withdrawal policy posted at http://socrates.fhda.edu/reg/todrop.html. If I wish to drop the class, I understand that I am fully responsible for completing all of the procedures necessary to drop the class.

I have read the course syllabus and this agreement. I agree to all course policies and procedures for the Advanced GIS Course.

Signature: _________________________________________ Date: ____________________
Name (Printed): ____________________________________ ID #: _____________________
## Advanced GIS, Winter 2003, Tuesdays 6 – 9:40 PM (Jan 7th – March 28th)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan 7th</td>
<td>Introduction, Review of Basic Concepts, Trends, Planning a GIS Project</td>
<td>Lab 1 Assigned&lt;br&gt;Reading: Text Chapters 1, 2, (Chapter 12 – Optional)</td>
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<tr>
<td>2</td>
<td>Jan 14th</td>
<td>GIS Database Design and Management</td>
<td>Signed Student Agreement Due&lt;br&gt;Lab 1 Due&lt;br&gt;Lab 2 Assigned</td>
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<td>3</td>
<td>Jan 21st</td>
<td>Introduction to Structured Query Language (SQL)</td>
<td>Lab 2 Due&lt;br&gt;Lab 3 Assigned&lt;br&gt;Reading: Text Chapter 4</td>
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<td>4</td>
<td>Jan 28th</td>
<td>Data Capture Techniques&lt;br&gt;Using the GPS as a GIS Tool</td>
<td>Optional: GPS Field Training, Sat Feb 1st&lt;br&gt;Reading: Text Chapter 5</td>
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<td>5</td>
<td>Feb 4th</td>
<td>Using the GPS as a GIS Tool (continued)&lt;br&gt;Review for Midterm Exam</td>
<td>Lab 3 Due&lt;br&gt;Lab 4 Assigned</td>
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<tr>
<td>6</td>
<td>Feb 11th</td>
<td>Midterm Exam</td>
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<td>7</td>
<td>Feb 18th</td>
<td>Data Capture Techniques (continued)</td>
<td>Lab 4 Due&lt;br&gt;Lab 5 Assigned&lt;br&gt;Reading: Text Chapter 10</td>
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<tr>
<td>8</td>
<td>Feb 25th</td>
<td>Identifying Potential Sources of Error in a GIS</td>
<td>Lab 6 Assigned</td>
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<tr>
<td>9</td>
<td>March 4th</td>
<td>Refining a GIS Project</td>
<td>Lab 5 Due</td>
</tr>
<tr>
<td>10</td>
<td>March 11th</td>
<td>What Makes a Good Map?&lt;br&gt;Review for Final Exam</td>
<td>Lab 6 Due&lt;br&gt;Reading: Text Chapter 6</td>
</tr>
<tr>
<td>11</td>
<td>March 18th</td>
<td>Final Exam</td>
<td></td>
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<tr>
<td>12</td>
<td>March 25th</td>
<td>Student Presentations</td>
<td></td>
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