COURSE NAME: GISC 3420.001: Geospatial Software Systems II – 4 sem. hrs.

INSTRUCTOR: Mr. Richard Smith
Office: CBI 113, Phone: (361) 825-2750
Email: Richard.Smith@tamucc.edu

CONSULTATION: 1:00 PM – 4:00 PM Monday and Wednesday or by appointment.
Available during these times on Skype as richardsmith-gsen
Available during these times on Saba Centra (link on course website)
Available any time at Virtual Office Hours: http://vyou.com/RickSmith

LECTURE TIMES: Tuesday and Thursday 11:00 AM – 12:15PM
LECTURE LOCATION: CI 229

LABORATORY TIME: Tuesday 2:30PM – 5:30PM in CI 226

COURSE WEBSITE: The Island Online (IOL) at: http://iol.tamucc.edu

COURSE DESCRIPTION:
Advanced programming course focusing on the design and implementation of GIS scripts and GIS web applications. Topics covered include GIS web applications, web mashups, GIS scripts, GIS tool creation, and advanced user interface design and implementation.

LEARNING OBJECTIVES:
1. Understand object oriented programming concepts.
2. Develop Python programs to script cartographic models.
3. Utilize APIs, modules, and libraries to develop new GIS applications and extend existing applications.

REQUIRED TEXTS:

Downey, Allen B. “Think Python”.
REQUIRED SOFTWARE & HARDWARE:
- ArcGIS 10 or higher with 3D Analyst and Spatial Analyst.
- Python - available on IOL course website and ArcGIS 10 Installation DVD.
- Adobe PDF viewer. (e.g. Adobe Acrobat Reader).
- Video player able to play MPEG-4 video (Quicktime, VLC, Windows Media Player).
- Speakers or headphones connected to computer with video player.
- High-speed internet access *highly* recommended.

COURSE REQUIREMENTS:
Course requirements include the following:
1. Attendance at lecture and participation in class discussion.
2. Completion and hand in of assignments by the due date.
3. Completion of exam by the scheduled due date.
4. Completion of semester project by scheduled due date.

EVALUATION:
1. Final Examination: 15%
2. Assignments: 60%
3. Semester Project: 25%
   TOTAL: 100%

GRADE COMPUTATION:
A  
≥90
B  
≥80 and <90
C  
≥70 and <80
D  
≥65 and <70
F  
<65

DUE DATES:
All assignments must be completed on time. Submission of an assignment after the due date is accepted, but with a penalty of 30% of the grade for the first 24 hours late, and 10% each additional 24 hours.

SEMESTER PROJECT:
Each student is required to develop a project by semester end. This project must use Python to develop a program which addresses a geospatial problem.

Each student must 1) submit a one-page project proposal by the 8th week, 2) provide all necessary code, datasets, etc… to execute project and 3) submit a final project report, including project description and your code by semester end.

The project proposal must include the objective of the project, programming language(s) and GIS data that will be used for the project. You may use existing code, but you must acknowledge the source of any code that you borrow in your application. The majority of the code submitted for the project must be of your own work.
## COURSE OUTLINE:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Review of Google Maps API, PHP and Ajax</td>
<td>As assigned</td>
<td>Revisiting Google Maps API</td>
</tr>
<tr>
<td>2</td>
<td>Introduction to PHP</td>
<td>As assigned</td>
<td>Server Side PHP</td>
</tr>
<tr>
<td>3</td>
<td>Using XML and PHP to exchange data</td>
<td>As assigned</td>
<td>Communication between client and server</td>
</tr>
<tr>
<td>4</td>
<td>Using JSON and PHP to exchange data</td>
<td>As assigned</td>
<td>Communication between client and server</td>
</tr>
<tr>
<td>5</td>
<td>Going full mash-up</td>
<td>As assigned</td>
<td>Working with eBay API</td>
</tr>
<tr>
<td>6</td>
<td>Going full mash-up</td>
<td>As assigned</td>
<td>Working with eBay API (cont.)</td>
</tr>
<tr>
<td>7</td>
<td>Introduction to Python Introduction to Model Builder</td>
<td>As assigned</td>
<td>First steps with Python</td>
</tr>
<tr>
<td>8</td>
<td>Python scripting for geoprocessing</td>
<td>As assigned</td>
<td>Introducing the GeoProcessing Object</td>
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<tr>
<td>9</td>
<td>Python scripting for geoprocessing</td>
<td>As assigned</td>
<td>Writing geoprocessing scripts</td>
</tr>
<tr>
<td>10</td>
<td>Python scripting for geoprocessing</td>
<td>As assigned</td>
<td>Writing geoprocessing scripts</td>
</tr>
<tr>
<td>11</td>
<td>Making tools with Python</td>
<td>As assigned</td>
<td>Tools and Validation</td>
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<tr>
<td>12</td>
<td>Customizing ArcGIS Desktop</td>
<td>As assigned</td>
<td>Customizing ArcGIS Desktop</td>
</tr>
<tr>
<td>13</td>
<td>Work on projects</td>
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<tr>
<td>14</td>
<td>Work on projects</td>
<td></td>
<td>Projects Due Project Presentations</td>
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<tr>
<td>15</td>
<td>Final Examination</td>
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**Note:** This course outline is a general plan for the course; deviations announced to the class by the Instructor may be necessary. The assignments that are given are related to Student Learning Outcomes stated above.
ADDITIONAL POLICIES AND INFORMATION:

Technological Excuses:
Hard drive crashes and other computer woes will not be accepted as excuses for late submission. Students should, given the complexity of the tasks they will pursue, be sure that they maintain adequate backup copies of all aspects of their work. Additionally, plan ahead so that you will have time to use the on-campus computers and printers if necessary. You may NOT submit papers/assignments by e-mail. If for some reason you feel you have to do this, you must ask for, and receive, permission ahead of time; furthermore, you may not consider an e-mailed paper/assignment to be submitted until you have received a reply confirming that I have received the paper/assignment.

Disabilities Accommodations:
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall (CCH) 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

Academic Advising:
The College of Science and Technology requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. The College's Academic Advising Center is located in Center for Instruction 350, and can be reached at (361) 825-6094.

Academic Honesty:
Cheating and plagiarism will automatically earn zero (0) points for the assignment or exam. All academic work must meet the standards contained in the 2010-2011 Graduate Catalog, pages 25-26, sections titled "Academic Integrity" and "Academic Honesty" available at http://catalog.tamucc.edu and/or Undergraduate Catalog, pages 44-45, sections titled "Academic Integrity" and "Academic Honesty" available at http://catalog.tamucc.edu

Each student is responsible to inform themselves about those standards before performing academic work.
Grade Appeal Process:
As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.
GENERAL GUIDELINES FOR COURSES AND LABS  
IN THE GISC PROGRAM  
CULTURE, REGULATIONS, MODES OF OPERATION AND PROCEDURES

These guidelines are designed to inform scholars of their responsibilities and of the course requirements in order to make this course a positive experience. The instructor is always available for consultation and discussion with students on any aspect of a course and of these general guidelines.

CLASS CULTURE

1. Consider yourself as a scholar rather than a student. The term “student” may imply some passivity, whereas the term “scholar” implies active participation, understanding and searching. We will use these terms interchangeably with the meaning of “scholar” implied. Osmosis does not work in a learning environment!
   
   **A good scholar takes notes at every class meeting.**

2. Further, define yourself as a “thinking explorer”. You are responsible for your education; an instructor can only be a guide and a facilitator. An instructor cannot learn for you. If you come across something that really interests you, explore it further.

3. Your experience at this University should not consist of passing a series of courses to earn a degree. Your experience should rather be a series of activities that will give you an education.

4. Concentrate on “learning to learn”. You will have to be a life-long learner to survive in your chosen career.

5. There is no such thing as a stupid question; there is such a thing as a stupid answer. So ask questions, the instructor is taking all the risks! Ask questions of your instructor and of your fellow scholars. Many times questions are more important than answers.

6. Keep copious notes of all that is going on in all the meetings related to your course. Make a note of what the instructor is stressing. At the end of each lecture you should be able to answer two questions: **What did I learn from this lecture?** and **What was not clear to me?** At the beginning of each lecture, if the instructor does not ask for questions, you need to ask if there is something you did not understand from the last lecture. Review, consolidate, annotate and organize your lecture/lab notes on a regular basis, at least once a week. The Internet is a tremendous resource and also a great danger. When you find information on the Internet, you have no idea if it is correct. View such information with caution. But, use the Internet to explore topics that interest you. Do not only prepare for the exam in a course – learn as much as you can on the topics introduced to you by the course material. You are responsible for the extent of your education! **READ MINDFULLY !!!!**

7. In addition to details of the syllabus given in class, the syllabus for the course includes all the chapters of the required textbook/s unless indicated otherwise by the instructor. The student is responsible for all materials/topics covered in class, in handouts, in assignments, in labs, and in outings or field trips. The instructor is NOT responsible for informing absent students exactly what was covered in previous classes, meetings, etc.
PROCEDURES & REGULATIONS

8. The final letter grade for the class will be based on the raw composite numerical score obtained from the weighted average of the tests, quizzes, exams, labs, etc. as indicated by the instructor. The raw composite numerical score may be adjusted (curved) based on the highest score, the statistical profile of the scores and other academic standards or other considerations. Generally, the letter grade of A is 90% and over of the adjusted score, a B is between 80% and 89% (inclusive) of the adjusted score, a C is between 70% and 79% (inclusive) of the adjusted score, a D is below 70% of the adjusted score and an F is below 65% of the adjusted score. An incomplete (I) will only be given in very unusual circumstances. The University regulations on incomplete grades state: “An incomplete notation may be given to a student who is passing but has not completed a term paper, examination, or other required work for reasons beyond the student’s control other than the lack of time.” Students are expected to take ALL tests, quizzes, exams, etc., and to complete and hand in all labs and other assignments. There is no provision for “extra credit”. No final grades will be given via the telephone, e-mail, etc.

9. All University rules, regulations and expected student conduct apply to this course. Students are held responsible for the information given in the current Catalog and Student Handbook. Make yourself aware of the University security regulations.

10. All labs, assignments, etc. must be handed in on the assigned due date. Scholars having problems must notify the instructor well before the due date. Marks will be deducted for poor and sloppily presented work.

11. Labs, etc. handed in after the due date may be subject to a penalty of loss of marks. Labs, etc. handed in after the graded labs, etc. have been returned to students will get zero marks but must be handed in to the instructor. Labs will be returned to students, after they have been graded, at a class meeting. Students who miss this meeting will be able to collect graded work during the instructor’s office hours or next class meeting.

12. Scholars are asked to take special note of the penalties, which the University attaches to Academic Dishonesty. Consult the Student Handbook.

13. All work handed in to the instructor must be the student’s own work. Extracts, excerpts, etc. from the work of others must be suitably noted, acknowledged and properly referenced. Any Group Work will be judged in the same way. That is, it is the work of the group and the extracts, excerpts, etc. of others must be acknowledged.

14. All written and graphical work handed in must be presented neatly printed and bound (staples are adequate). Students’ written work will be judged on written communication skills, critical thinking and problem solving ability.

15. Students are expected to be present at all meetings (lectures, labs, etc.) of the class. Students are expected to be present at the date and time assigned for all tests, exams, quizzes, etc. There are NO provisions for making up missed exams except in cases where prior arrangements have been made and agreed to by the instructor. During the assigned lab session, ONLY assigned labs are to be done. All other work must be done in other rooms.

16. All cellular phones and other similar devices MUST BE TURNED OFF during lectures, labs and other class meetings.

17. All students must keep their university e-mail addresses (firstname.lastname@islander.tamucc.edu). This will be the means of communication between the instructor and the class.

18. The instructor reserves the right to make changes to the above with due notice to the students. These changes will be announced in class and each student is responsible for keeping herself/himself informed of such changes.