GISC 2301 – Geospatial System II  
School of Engineering and Computing Science  
Spring 2016

A. COURSE INFORMATION

<table>
<thead>
<tr>
<th>Course number/section</th>
<th>GISC 2301.001/2301.201/2301.W01/2301.W11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class meeting time/Location:</td>
<td>Lecture: MW 10:00 - 10:50 AM, CI-229</td>
</tr>
<tr>
<td></td>
<td>Lab: M 11:00-1:50 PM, CI-229</td>
</tr>
<tr>
<td>Course Website:</td>
<td><a href="https://bb9.tamucc.edu/">https://bb9.tamucc.edu/</a></td>
</tr>
</tbody>
</table>

B. INSTRUCTOR INFORMATION

Instructor: Dr. Yuxia (Lucy) Huang  
Office location: CBI 109  
Office hours: T 12:30 – 2:30 PM; W 8:45 – 9:45 AM; R 12:30 – 2:30 PM  
Telephone: 361-425-2646  
e-mail: Lucy.Huang@tamucc.edu

C. COURSE DESCRIPTION

Catalog Course Description  
GIS II is an intermediate level course in the concepts and applications of GIS, with a focus on GIS analysis methods and their applications. This course has a lecture and a lab component. Topics covered include spatial data processing and analysis, terrain mapping and analysis, spatial database design and management, and geodatabase. The technical focus of the course includes computer lab tutorials and group projects using the leading desktop GIS software, ArcGIS 10.1 from ESRI.

D. PREREQUISITES AND COREQUISITES

Prerequisites  
GISC1470 and MATH 2413

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

Optional Textbook(s) or Other References
Note to Online Students

- You are responsible for checking emails (your islander account) daily for announcements, lectures, labs, exams and other assignments.
- Lectures will be posted on Class BlackBoard immediately after the in-class meeting. It is your responsibility to read the lectures in a timely fashion so you stay up with the course.
- Laboratory and other assignments will also be posted on BlackBoard and will be completed on your home computer and must be submitted digitally to the BlackBoard online on time by the due date.
- You are responsible for installing the required software in a timely fashion and keeping your home computer and internet access in working order.

Required Software & Hardware for Online Students

- Windows Operating System (XP/Vista/7).
- ArcGIS 10.2 with 3D Analyst and Spatial Analyst extensions. This is provided in lab on campus. If attending online, software will be provided as a download.
- Adobe PDF viewer. (e.g. Adobe Acrobat Reader).
- Video player able to play MPEG-4 video (Quicktime, VLC, Windows Media Player).
- Web browser with Java Virtual Machine installed.
- Speakers or headphones connected to computer are required for online students.
- Microphone or headset connected to computer.
- High-speed internet access required.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Extract spatial information from data using vector and raster data analysis
2. Understand terrain mapping and analysis methods and apply these methods to solve real world problems.
3. Understand fundamental concepts and principles for spatial database design and management
4. Design, create and work with Geodatabase
5. Understand the practical applications of GIS

G. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 3</td>
<td>15%</td>
</tr>
<tr>
<td>Labs</td>
<td>25%</td>
</tr>
<tr>
<td>Article Review and Presentation</td>
<td>15%</td>
</tr>
<tr>
<td>Group Project</td>
<td>15%</td>
</tr>
</tbody>
</table>

**Labs**
There will be tentatively 13 labs to help students familiarize with basic and advanced GIS operations and applications. Most of labs are from ESRI GIS Tutorial books, and some labs build upon each other, so it is important to be up to date on your labs.

**Exams**
There will be tentatively THREE exams in this course. These exams are non-cumulative. There will be no make-up exams. Exceptions are possible only with documentation of a medical or family emergency.

**Group Projects**
We will have group projects during the last six weeks of class. There are about 2-3 people in a group, and the groups will be formed with your input. A specific topic will be assigned to each group and it is up to each group to figure out the best way to work together. Each group will create a Word document report that includes a detailed description and product of your project and maps inserted. The length of the report is 5-10 pages, 12pt Times New Roman font, double-spaced, 1” margins, and 8.5” by 11” paper space. During the last week of class, each group will also present your project. In addition to the group submission, each group member will have to turn in a (private) evaluation of each group member. The grade for the group project is based on your report, the presentation of your project, and the evaluation of group members (1/3).

**Article Review and Presentation**
Each student is expected to read three (3) GIS application articles and develop a review for each article. The 3 articles should cover ONE topic of student’s interest. All articles must be peer-reviewed journal or conference publication.
Each article review should be typed in one double-spaced page. The review should briefly describe: 1) the purpose of the study, 2) the data and GIS analysis used for the study (1/2 page minimum), 3) general critique – your opinions of how well (or poorly) the authors did their research in the article, and 4) the full bibliographic reference of the article. The review usually is due on Mondays via BlackBoard. Each review will be given a maximum of 5 points.

At the end of the semester, each student is expected to summarize these reviews and give a presentation to the class.

Reference format of the Article

Articles in Journals

Conference proceedings

Journals that cover GIS
Cartography and Geographic Information Systems
Computers and Geosciences
Computers, Environment and Urban Systems
Journal of Geographical Systems
Geoinformatica
International Journal of Geographical Information Science
Transactions in GIS
Environment and Planning B
International Journal of Health Geographics

* Interlibraryloan provided by our library is a good resource to request articles from other libraries.

Websites for journal article search
http://www.sciencedirect.com/ (In order to access full-text articles from this website, you need to use the computer on campus)
http://scholar.google.com
## H. COURSE CONTENT/SCHEDULE *(Subject to Change)*

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture</th>
<th>Reading</th>
<th>Labs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><em>Section 1: GIS data source and analysis</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 2: Terrain mapping and analysis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Week 1

- **Jan. 20**: Course Introduction

### Week 2

- **Jan. 25**: Review session
  - GIS data models
  - Vector data analysis
- **Jan. 27**: Raster data analysis
  - [Bolstad] Chapter 10

### Week 3

- **Feb. 1**: Raster data analysis *(Article review topic due)*
  - [Bolstad] Chapter 10
- **Feb. 3**: Geoprocessing in ArcGIS 10
  - [Gorr & Kurland] Chapter 6

### Week 4

- **Feb. 8**: Descriptive summary and Inference
  - Handouts
- **Feb. 10**: Automating processes – ModelBuilder
  - [Allen] Chapter 7
- **Feb. 15**: US Census data – TIGER data and attributes
  - Exam Review
- **Feb. 17**: Exam 1 – covers Week 1-4

### Week 5

- **Feb. 22**: Representation of terrain *(Article Review 1 due)*
  - [Bolstad] Chapter 11
- **Feb. 24**: Terrain mapping, 3D surface analysis (slope and aspects)
  - Handouts

### Week 6

- **Feb. 29**: 3D surface analysis – Viewsheds
  - Handouts
- **March 2**: 3D surface analysis - Watersheds
  - Handouts

### Week 7

- **March 7**: Surface Interpolation application
  - Handouts
- **March 9**: 3D visualization
  - Exam Review
  - Handouts
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>Labs</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>March 14-18</td>
<td>Spring break, No Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>March 21</td>
<td>Database Systems (Article Review 2 due)</td>
<td></td>
<td>Lab 8: 3D Visualization</td>
</tr>
<tr>
<td></td>
<td>March 23</td>
<td>Relational Database design (Groups will be formed)</td>
<td>[Bolstad] Chapter 12</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>March 28</td>
<td><strong>Exam 2 – covers Week 5-8</strong></td>
<td>[Allen] Chapter 1</td>
<td>Lab 9: Designing and Creating a geodatabase [Allen, Tutorial 1-1, 1-2]</td>
</tr>
<tr>
<td></td>
<td>March 30</td>
<td>Relational Database design</td>
<td></td>
<td>Handout</td>
</tr>
<tr>
<td>11</td>
<td>April 4</td>
<td>Introduction to SQL, Spatial Database Management and Design</td>
<td>Handout</td>
<td>Lab 10: building a geodatabase [Allen, Tutorial 2-1, 2-2]</td>
</tr>
<tr>
<td></td>
<td>April 6</td>
<td>ESRI Geodatabase Model</td>
<td>[Allen] Chapter 2</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>April 11</td>
<td>Creating and populating geodatabases (Article Review 3 due)</td>
<td>[Allen] Chapter 3</td>
<td>Lab 11: Populating a geodatabase [Allen, Tutorial 3-1, 3-2]</td>
</tr>
<tr>
<td></td>
<td>April 13</td>
<td>Working with features</td>
<td>[Allen] Chapter 4</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>April 18</td>
<td>Working with topology Review Session</td>
<td>[Allen] Chapter 5</td>
<td>Lab 12: Working with features [Allen, Tutorial 4-1, 4-2, 4-3, 4-4, 4-5]</td>
</tr>
<tr>
<td></td>
<td>April 20</td>
<td><strong>Exam 3 – Covers Week 9-13</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Section 4: GIS Applications**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>Labs</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>April 25</td>
<td>GIS Applications: Students Presentation</td>
<td></td>
<td>Lab 13: Working with topology [Allen, Tutorial 5-1, 5-2, 5-3]</td>
</tr>
<tr>
<td></td>
<td>April 27</td>
<td>GIS Applications: Students Presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>May 2</td>
<td>GIS Applications: Students Presentation</td>
<td></td>
<td><strong>Work on Group Project</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Monday, 5/9, 8:00-10:30 am</strong></td>
<td><strong>Group Project Presentation</strong></td>
<td>Group project report due</td>
</tr>
</tbody>
</table>

*Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.*
I. COURSE POLICIES

Due Date and Late Policy
Each of the labs will have a due date clearly written under the title of the lab. All labs must be completed on time. Any lab that is turned in after the due date is considered late. Submission of a late lab is accepted, but with a penalty of 10% of the grade per day (including weekends). Late lab will only be accepted up to ONE WEEK after they are due. Exceptions are possible only with prior permission and for exceptional cause (with written documentation). Please work well ahead of the deadlines!

Make-up Exams
There will be no make-up exams. Exceptions are possible only with documentation of a medical or family emergency.

Extra Credit
There is no provision for “extra credit”. No final grades will be given via the telephone, e-mail, etc.

Cell Phone Use
All cellular phones and other similar devices MUST BE TURNED OFF during lectures, labs and other class meetings

J. COLLEGE AND UNIVERSITY POLICIES

• Academic Advising
The College of Science and Technology requires that graduate students meet with their Graduate Advisor for assistance with initial course selection as soon as the students are accepted to a graduate program. By the end of the first year of graduate studies graduate students should meet with their Graduate Committees to set up a degree plan. Graduate students are also encouraged to contact the appropriate College Academic Advisor regarding any questions or problems with their program of study. The College of Science and Technology Academic Advising Center is located in Center for Instruction, Room 350, and can be reached at 825-6094.

• Academic Integrity (University)
It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
See Full University Policy at http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity

• Classroom/Professional Behavior
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the
ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course by Friday, April 8, 2016. No student is eligible to receive a W without completing the official drop process by this deadline. Visit the Office of the University Registrar for the Course Drop Form that must be submitted. After April 8, 2016 a student will not be allowed to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, 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 Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  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 (361) 825-5816 or visit Disability Services in Corpus Christi Hall 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.

[http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)
GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.