GSEN 5365 – Spatial Database Design  
School of Engineering and Computing Science  
Spring 2017

A. COURSE INFORMATION

<table>
<thead>
<tr>
<th>Course number/section</th>
<th>GSEN5365.001/GSEN5365.W01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class meeting time</td>
<td>M: 1:00 - 3:30 PM</td>
</tr>
<tr>
<td>Class meeting location:</td>
<td>CBI 104</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 9:00 – 12:00 PM; W 11:00 – 1:00 PM or by appointment  
Telephone: 361-425-2646  
e-mail: Lucy.Huang@tamucc.edu

C. COURSE DESCRIPTION

Catalog Course Description  
This course will focus on spatial database principles and the practical skills of design, implementation, and use of spatial databases. Topics covered include basic database model, spatial database design and management, and case studies. Advanced knowledge and skills in spatial databases are also covered.

D. PREREQUISITES AND COREQUISITES

Prerequisites - Permission of the program coordinator

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. Understand the principles of relational database in general and how they apply to GIS applications
2. Be familiar with spatial database models, spatial queries and spatial indexing.
3. Design, create, implement and work with Esri Geodatabase for various applications
G. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>45%</td>
</tr>
<tr>
<td>Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Presentation on Case Studies</td>
<td>10%</td>
</tr>
<tr>
<td>Term Project</td>
<td>20%</td>
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Assignments
There are tentatively five (5) assignments. The assignments will be posted on BlackBoard every other week, normally on Wednesdays. The assignments are due in two weeks. [Allen & Coffey]'s book will be used for assignments. ESRI’s ArcGIS 10.1 or higher will be used for assignments.

Exam
There will be ONE exam, which takes 25% of the total grade. There will be no make-up exams. Exceptions are possible only with documentation of a medical or family emergency.

Presentation on Case Studies
The last section of this course is “Designing Geodatabases – Cases Studies (See the outline)”. In this section, several cases studies will be covered and students will lead and present the topics for each case study.

Term Project
Each student is required to develop a project by the end of the semester. The project is expected to design, develop and implement a spatial database to store and manage spatial data that solves a problem of your own choosing. Each student must: 1) submit a one-page project proposal; and 2) complete a term paper to report the design and implementation of your spatial database.

The project proposal must include the objective(s) of the project and GIS data that will be used for the project.

The length of the final report is 8-12 pages, 12pt Times New Roman font, double-spaced, 1" margins, and 8.5" by 11" paper space. The final report should follow the format of formal journal articles including at least, Abstract, Introduction/Problem, Data/Methods, Results/Discussion, and Conclusion.
### H. COURSE CONTENT/SCHEDULE (Subject to Change)

<table>
<thead>
<tr>
<th>Week/Date</th>
<th>Lecture</th>
<th>Reading</th>
<th>Assignments *</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 / Jan. 23</td>
<td>Course introduction Database systems Relational database model</td>
<td>[Coronel] Chapters 1,2-3</td>
<td></td>
</tr>
<tr>
<td>2 / Jan. 30</td>
<td>Entity Relationship (E-R) model</td>
<td>[Coronel] Chapter 4</td>
<td>Assignment 1 [Allen] Chapter 1</td>
</tr>
<tr>
<td>3 / Feb. 6</td>
<td>Normalization of database tables</td>
<td>[Coronel] Chapter 6</td>
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**Section 1: The Basics of Relational Databases**

<table>
<thead>
<tr>
<th>Week/Date</th>
<th>Lecture</th>
<th>Reading</th>
<th>Assignments *</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 / March 6</td>
<td>Design and build Geodatabase</td>
<td>[Allen] Chapters 1-3</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td><strong>Spring Break (March 13-17)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 / March 20</td>
<td>Working with Geodatabase</td>
<td>[Allen] Chapters 4-5</td>
<td>Assignment 4 [Allen] Chapter 4</td>
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**Section 2: Spatial Database and Design**

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<thead>
<tr>
<th>Week/Date</th>
<th>Lecture</th>
<th>Reading</th>
<th>Assignments *</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 / March 27</td>
<td>Exam / Project proposal</td>
<td></td>
<td><strong>Project Proposal due</strong></td>
</tr>
<tr>
<td>11 / April 3</td>
<td>Geodatabase design and build Streams and river networks</td>
<td>[Arctur] Chapters 1,9, 2</td>
<td>Assignment 5 [Allen] Chapter 5</td>
</tr>
<tr>
<td>12 / April 10</td>
<td>Census units and boundaries Addresses and locations</td>
<td>[Arctur] Chapters 3,4</td>
<td></td>
</tr>
<tr>
<td>13 / April 17</td>
<td>Parcels and the Cadastre Surveying federal lands</td>
<td>[Arctur] Chapters 5,6</td>
<td></td>
</tr>
<tr>
<td>14 / April 24</td>
<td>Using raster data/base map</td>
<td>[Arctur] Chapters 7,8</td>
<td></td>
</tr>
<tr>
<td>15 / May 1</td>
<td>Project</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Monday, 5/8, 11:00 - 1:30 pm</strong></td>
<td><strong>Project Presentation</strong></td>
<td></td>
<td><strong>Project report due</strong></td>
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**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.

*The assignments will be posted on BlackBoard every other week, normally on Mondays as shown in the above schedule and you have two weeks to complete the assignments. For example, the first assignment will be given on
I. COURSE POLICIES

Due Date and Late Policy
All submittals must be completed on time. Any submittal that is turned in after the due date is considered late. Late submission is accepted, but with a penalty of 10% of the grade per day (including weekends). *Late submittals 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.

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.

J. COLLEGE AND UNIVERSITY POLICIES

- Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. *(Plagiarism is the presentation of the work of another as one’s own work.)* In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.
• **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.

• **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

• **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. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) for the last day 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/)

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

### K. OTHER INFORMATION

- **Academic Advising**
  The College of Science & Engineering 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. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

### 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.