GSEN 5365 – Spatial Database Design
School of Engineering and Computing Science
Spring 2016

A. COURSE INFORMATION

<table>
<thead>
<tr>
<th>Course number/section</th>
<th>GSEN5365.001/GSEN5365.W01</th>
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</thead>
<tbody>
<tr>
<td>Class meeting time</td>
<td>TR: 11:00 -12:15 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 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
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 is 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, 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 develop 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 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, 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>
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<tbody>
<tr>
<td><strong>Section 1: The Basics of Relational Databases</strong></td>
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<tr>
<td>Jan. 21</td>
<td>Course Introduction</td>
<td>[Coronel] Chapter 1</td>
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<tr>
<td>1 / Jan. 25-29</td>
<td>Database Systems The Relational Database Model</td>
<td>[Coronel] Chapters 2-3</td>
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<tr>
<td>2 / Feb. 1-5</td>
<td>Entity Relationship (E-R) Model</td>
<td>[Coronel] Chapter 4</td>
<td>Assignment 1</td>
</tr>
<tr>
<td>3 / Feb. 8-12</td>
<td>Normalization of Database Tables</td>
<td>[Coronel] Chapter 6</td>
<td>Assignment 2</td>
</tr>
<tr>
<td>4 / Feb. 15-19</td>
<td>Structured Query Language (SQL)</td>
<td>[Coronel] Chapter 7-8</td>
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<tr>
<td><strong>Section 2: Spatial Database and Design</strong></td>
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<tr>
<td>5 / Feb. 22 – Feb. 26</td>
<td>Spatial Database and Spatial Queries</td>
<td>Handout</td>
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<tr>
<td>6 / Feb. 29 – March 4</td>
<td>Spatial Index and Spatial Mining</td>
<td>Handout</td>
<td>Assignment 3</td>
</tr>
<tr>
<td>7 / March 7-11</td>
<td>Design and build Geodatabase</td>
<td>[Allen &amp; Coffey] Chapters 1-3</td>
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<tr>
<td><strong>Spring Break (March 14-18)</strong></td>
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<tr>
<td>9 / March 21-25</td>
<td>Working with Geodatabase</td>
<td>[Allen] Chapters 4-5</td>
<td>Assignment 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Allen] Chapter 4</td>
<td></td>
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<tr>
<td><strong>Section 3: Designing Geodatabases – Cases Studies</strong></td>
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<tr>
<td>10 / March 28 – April 1</td>
<td>Exam Project</td>
<td></td>
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<tr>
<td>11 / April 4 - 8</td>
<td>Geodatabase Design Streams and River networks</td>
<td>[Arctur] Chapters 1,2</td>
<td>Assignment 5</td>
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<tr>
<td></td>
<td></td>
<td>[Allen] Chapter 5 (Project Proposal due)</td>
<td></td>
</tr>
<tr>
<td>12 / April 11-15</td>
<td>Census Units and boundaries Addresses and locations</td>
<td>[Arctur] Chapters 3,4</td>
<td></td>
</tr>
<tr>
<td>13 / April 18</td>
<td>Parcels and the Cadastre</td>
<td>[Arctur] Chapters 5,6</td>
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</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.

*The assignments will be posted on BlackBoard every other week, normally on Thursdays as shown in the above schedule and you have two weeks to complete the assignments. For example, the first assignment will be given on Thursday Feb. 4, and it is due Thursday, Feb. 18.

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
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 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, and the College of Science and Engineering Grade Appeals webpage at 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/

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.