SYLLABUS

Spatial Systems Science (CMSS 6330)

Spring Semester 2012
Tuesday and Thursday, 7:00 pm to 8:15 pm
Center for Instruction, CI-107

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Office Hours: by appointment, send email or call

Description: Geospatial data management and analysis is a fundamental activity in describing, documenting, and modeling the coastal and marine environment. This course will examine the various types of geospatial data, including remote sensing data. We will discuss the acquisition of data and its characteristics and applications to studies of coasts and oceans. A geographic information system (ArcGIS) will be used to manage data and investigate patterns and relationships.

Format and Major Requirements: The course will be taught in a lecture, discussion, and case-study format. Weekly reading will be assigned. There will be up to twelve assignments requiring the management and analysis of geospatial data using ArcGIS. A midterm and final exam with short answer formats will be given.

Text Books:


Student Learning Outcomes:
1. Students will be able to design and implement a geospatial project in ArcGIS software.
2. Students will be able to find and compile various geospatial data types and perform geospatial analysis.
3. Students will understand the limitations and advantages of various remote sensing instruments and data types for studying the coastal and marine environments.
4. Students will be able to describe the general characteristics and functions of coastal and marine environments

**Course Grading:**
Your final grade will be based on the following point distribution:
Assignments combined = 50%
Midterm exam = 25%
Final exam = 25%

**Provisional Course Outline and Schedule**

**Topical Outline**

1. Datums, projections, coordinate systems

2. Global Positioning System

3. Representing the coastal and marine environment with geospatial data
   a. Raster data
   b. Vector data
   c. Data models (Arc Marine)

4. Remote sensing of coastal and marine environments
   a. Electromagnetic Radiation Principles
   b. Instruments and data types
   c. Analysis approaches and issues

5. Spatial data analysis

6. GIS Project Implementation

**Class Schedule (subject to adjustments)**

**Week 1: Course introduction**
January 12 – class
Reading: Chapter 1, Lo and Yeung

**Week 2: Intro to ArcGIS, Datums, projections, coordinate systems**
January 17 – class
January 19 – class
Reading: Chapter 2, sections 2.1 through 2.5, Lo and Yeung

**Week 3: Datums, projections, coordinate systems**
January 24 – class
January 26 – class
**Week 4: Global Positioning System**
January 31 – class, ASSIGNMENT 1 DUE (ESRI-Learning ArcGIS Desktop)
February 2 – class
Reading: Chapter 3, Lo and Yeung

**Week 5: Representation and organization of geospatial data**
February 7 – class, Gibeaut out of town, ASSIGNMENT 2 DUE
February 9 – class, Gibeaut out of town
Reading: Chapter 5, o.k. to skip section 5.5 and not to dwell on sections 5.3.3 and 5.3.4. Raster Geoprocessing, Lo and Yeung

**Week 6: Representation and organization of geospatial data**
February 14 – class, Gibeaut out of town, ASSIGNMENT 3 DUE
February 16 – class, Gibeaut out of town

**Week 7: Raster geoprocessing**
February 21 – class
February 23 – class
Reading: Chapter 6.1, 6.2, 6.4, 6.5, 6.6, Vector Geoprocessing, Lo and Yeung

**Week 8: Vector geoprocessing**
February 28 – class, Gibeaut out of town, ASSIGNMENT 4 DUE
March 1 – class, Gibeaut out of town, ASSIGNMENT 5 DUE

**Week 9: Vector geoprocessing/midterm review/midterm**
March 8 – class
MARCH 10 – MIDTERM EXAM – Through Vector Processing

**Spring Break**
March 13 – no class
March 15 – no class

**Week 10: Arc Marine Data Model, Remote sensing of coastal and marine environments**
March 20 – class
March 22 – class, ASSIGNMENT 6 DUE
Reading: Chapter 1, Remote Sensing of the Environment, Jensen
Reading: Chapter 2, Electromagnetic Radiation Principals, Jensen

**Week 11: Remote sensing of coastal and marine environments**
March 27 – class, Gibeaut out of town
March 29 – class, Gibeaut out of town, ASSIGNMENT 7 DUE
Reading: Chapter 6 pages 183 (creation of digital orthoimages) to page 192, Jensen
Chapter 7, Multispectral Remote Sensing Systems, (read this material for background) Jensen
**Week 12: Remote sensing of coastal and marine environments**
April 3 – class
April 5 – class
Reading: Chapter 8 page 274 to page 288, Thermal Infrared Remote Sensing, Jensen.
Chapter 11, Remote Sensing of Vegetation, Jensen

**Week 13: Remote sensing of coastal and marine environments, Spatial data analysis**
April 10 – class
April 12 – class
Reading: Chapter 12, Remote Sensing of Water, Jensen

**Week 14: Spatial data analysis**
April 17 – class
April 19 – class— ASSIGNMENT 8 DUE
Reading: Chapter 10, Spatial Data Analysis, Modeling, and Mining, Lo and Yeung

**Week 15: Spatial data analysis**
April 24 – class
April 26 – class

**Week 16:**
May 1 – last class.

**MAY TBD- FINAL EXAM**

**Academic Integrity/Plagiarism:** 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 (                 ).

**Dropping a Class:** I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. (                 ) is the last day to drop a class with an automatic grade of “W” this term.

**Notice to Students with Disabilities:** 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 Driftwood 101.

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.

**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](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.