### GEOG 4365: Fall 2017 Applied Geographic Information System (3 Credit Hours: Lecture and Computer Lab)

### **CONTACT INFORMATION**

Instructor: Dr. Samuel Adu-Prah E-mail: <u>sxa054@shsu.edu</u> Office: Lee Drain Building Room 00324 Lecture: TR 9:30 – 10:50 a.m.; RM 327 Office Hours: TR-2.00 – 3.00 pm or by appointment

## **COURSE DESCRIPTION**

Applied GIS is designed to meet the needs of a highly applied course with realistic practical training extending the fundamental principles learned in GIS and geospatial applications. The application of GIS technology to mapping, modeling and management of large databases will be emphasized. The GIS areas to be covered include data acquisition, formats, and quality, georeferencing, spatial data models and databases, statistics and spatial data measurements, and cartography. Students will be given the option to apply the knowledge gained to their area of interest (i.e. public health, business, emergency services, industry, urban planning, politics, education, etc.) in a final project.

## **OBJECTIVES:**

The lecture and laboratory components of the course will enable students to:

- 1. Understand the fundamentals and applications of GIS
- 2. Develop an understanding of quality and validity of GIS data
- 3. Learn about availability and capability of ArcGIS tools and extensions
- 4. Develop critical thinking about the GIS process and apply to specific area of interest for a final project.

## **COURSE MATERIALS**

### **Required:**

Mastering ArcGIS, Maribeth Price. 6/7<sup>th</sup> Edition (ISBN- 978-0-07-802142-8). McGraw Hill publishers.

### **Reference:**

Introductory Geographic Information Systems. Jensen J.R., and Jensen R.R. 2013. (ISBN- 978-0-13-614776-3). Pearson Prentice Hall.

Geographic Information Systems & Science. Longley, P.A., Goodchild, M.F., Maguire, D.J., and Rhind, D.W. 2011. (ISBN- 978-0-470-72144-5)

### **COURSE PREREQUISITES**

Required: GIS course, or Consent of Instructor

### LABORATORY AND HOMEWORK ASSIGNMENTS:

Students are expected to attend class (both lecture and laboratory) regularly, take exams, complete lab assignments, course project, and quizzes. The laboratory component of this course will make extensive use of ArcGIS software and extensions. The labs will use Mastering ArcGIS textbook and instructor's developed labs. A course project will be completed in groups. Students are required to use the knowledge and skills acquired during the course to complete the project. All work will be due on the date specified. Late assignments will not be tolerated.

#### ASSESSMENT/EVALUATION

To achieve the course objectives students will be evaluated on the basis of 2 exams (midterm, finals), 4 quizzes, lab exercises, and a group project presentation. All lab reports and assignments must be received on time. Attendance and participation in class activities are very important and will account for part of the total grades.

Grades will be based on the following:

Group Project presentation	150	15%
Midterm Exams	250	25%
Quizzes	100	10%
Lab reports, assignments and Exercises	200	20%
Participation and Attendance	50	5%
Final Exams	250	25%
Total Score	1000	100%

#### **Table 1: Assessment/Evaluation points**

Grading will be on the scale: 90 - 100% - A Range

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- B Range
- C Range
- D Range
- F Range

#### **ADDITIONAL COMMENTS:**

This class represents a commitment of time and energy for both the faculty and student. It is expected that the student put in an additional hours of work for this course. This means that some students will have to put in even more time to learn the material presented in this course. Work schedules or other responsibilities do not represent acceptable exceptions to this obligation.

Office hours have been listed above. Other hours can be arranged if necessary. If you have problems, please see me as soon as possible. Waiting until the end of the semester may be too late.

**Absences:** In accordance with University Policy, regular attendance is required; however, no point will be awarded or subtracted based on your attendance. You are responsible for all material covered in every class, regardless of whether you attended or not. It is your responsibility to obtain notes, assignments, etc., from fellow class members if you miss a class. Absences for religious holy days must be scheduled with the instructor in accordance with official university policy. University policy states that a student who is absent from class for the observance of a religious holy day must be allowed to take an examination or complete an assignment scheduled for that day within a reasonable amount of time after the absence. Students must be excused to travel for observance of a religious holy day. A student who wishes to be excused for a religious holy day must present the instructor with a written statement describing the holy day(s) and the travel involved. The instructor will provide the student with a written description of the deadline for the completion of missed exams or assignments.

Academic Integrity: The Student Code of Conduct (*section 5.3*) states that the University expects all students to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. Furthermore, the University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to cheating on an examinations or other academic work which is to be submitted, plagiarism, unauthorized collusion, and the abuse of resource materials. All students must fully develop their own solutions. You are not allowed to work together on any assignment. Do not copy anyone else's assignment and do not allow your assignments to be copied. Cheating on any portion of an assignment will result in a grade of zero for the entire assignment.

**Proper Classroom Demeanor**: In compliance with the University Code of Conduct, students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Please turn off or mute your cellular phone and/or pager before class begins. Students are prohibited from eating in class, using tobacco products, making offensive remarks, using inappropriate language, reading newspapers, sleeping, talking among each other at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in, minimally, a directive to leave class or being reported to the Dean of Students for disciplinary action in accordance with university policy.

#### STUDENTS WITH DISABILITIES POLICY:

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail <u>disability@shsu.edu</u>). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see:

http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf

**Visitors in the Classroom**: Occasion visiting of classes by responsible persons is allowed with prior arrangement with the instructor, as long as it does not interfere with the registered members of the class or the educational process. Unannounced visitors to class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in the classroom.

### **COURSE SCHEDULE:** <u>Lecture</u>: **T** 09:30 am - 10:50 am, LDB 00327, <u>Computer Lab</u>: **R** 09:30 am -10:50 am, LDB 00327

Week	Lecture Topic	Lab Textbook\Topics Mastering ArcGIS
Week 1: Aug 23	Course Introduction & Overview Introduction to GIS (Spatial data)	
Week 2: Aug 28	Data for GIS Quiz 1	Ch 1: <i>Lab 1 - Assignment to submit Exercise</i> <i>Page 40 Questions 1-5</i>
Week 3: Sept.4	<i>Labor Day Holiday Monday, Sept 4</i> Georeferencing	Ch 2: <i>Lab 2 - Assignment to submit Exercise</i> <i>Page 70 Questions 1-8</i>
Week 4: Sept. 11	Data quality and metadata	Ch 11 Lab 3- Assignment to submit Exercise Page 326 Questions 1-5
Week 5: Sept: 18	Spatial Data Models and Databases Quiz 2	Ch 3: <i>Lab 4-</i> Assignment to submit Exercise Page 98 Questions 1
Week 6: Sept. 25	Raster and Vector Data Analysis	Ch 4 Lab 5- Assignment to submit Exercise Page 127 Questions 1-5
Week 7: Oct 2	Statistics and Spatial data Measurements Quiz 3	Ch 5: <i>Lab 6-</i> Assignment to submit Exercise Page 154 Questions 1-5
Week 8: Oct 9	Midterm Exams-Thursday, Oct 12	
Week 9: Oct 16	Geodatabases	Ch 7: <i>Lab</i> 7- Assignment to submit Exercise Page 124Questions 1-5
Week 10: Oct. 23	Network Analysis	
Week 11: Oct 30	Cartography Using a GIS <i>Quiz 4</i>	Ch 9 <i>Lab 8- Assignment to submit Exercise</i> <i>Page 266 Questions 1-5</i>
Week 12: Nov 6	GIS Hardware/Software and Programming	Ch 10: <i>Lab 9-</i> Assignment to submit Exercise Page 294 Questions 1&2
Week 13: Nov 13	Industry – Public Health	
Week 14: Nov 20	Thanksgiving Vacation WRF, Nov. 22, 23, 24	
Week15: Nov 27	Final Group Project Presentations	
Week 16: Dec 4-7	Final Exams	Tuesday, December 05, 2017 10:30 a.m. – 12:30 a.m.

# Topical Outline: Subject to change/revised

Course Web site: Blackboard