GISC 1411 – Introduction to GIS

Credit: 4 (LECTURE: 2 hours per week; LABORATORY: 2 hours per week)
Prerequisites: Basic Computer skills

Instructor: Dr. Andrew Y Kudowor

(Ph.D. Geomatic Eng; MSc & BSc. Surveying Engineering, Certificate Smallworld GIS)

E-mail: andrew.kudowor@hccs.edu

Course Description

This is a 4 credit hour course with lecture and laboratory components. The course will make use of the internet for course materials and assumes students familiarity with the internet.
The course will introduce students to the theory, concepts, and applications of GIS. It will provide the tools and skills needed for using GIS to capture, analyze, manage, and display spatial and non-spatial data. The course will present students with the general architecture of ESRI's GIS software (ArcGIS) and distinguish between the different GIS data models and data formats. Students will study management of geographic information using relational database, basic SQL, and geodatabase concepts and perform spatial analysis. Specific topics will include demographic management, geo-coding, information storage and access, and GIS for modeling and analyzing industry specific geographic data.
The course will focus on giving the students an understanding of how GIS concepts and practice can be used to analyze, visualize, and solve geographic problems.

Course Contents

GIS is implemented in a wide range of applications, where spatial data needs to be managed, analyzed and displayed. This course provides students with knowledge and hands on experience to develop understanding and skills in the following topics;

1. The nature of spatial and non-spatial data including;
    a. Capturing methods
    b. Data acquisition
2. Spatial data models including;
    a. Vector models
    b. Raster models
3. Data manipulation and representation including;
    a. Data conversion
    b. Data analysis
    c. Data quality evaluation
    d. Mapping concepts
    e. Map projections and coordinate systems
4. Spatial and non-spatial data management including;
    a. Relational database concepts
    b. Geodatabase concepts

5. ArcGIS architecture including;
    a. ArcGIS procedures
    b. Data management tools in ArcGIS
    c. GIS project development using ArcGIS
6. Specific example of the application of GIS including;
    a. Demographic modeling and analysis.
    b. Geocoding –converting alphanumeric description of locations (addresses) into GIS usable format to create an efficient route map of student's homes.
    c. Managing an oil/gas pipeline data using geodatabase concepts

Course Objectives

By the end of this course students should:

- Understand the basic structure, concepts, and theories of GIS
- Understand the different data capturing methods
- Be familiar with the different data models
- Be familiar with sources of digital geographic data
- Be able to understand the architecture of ESR's ArcGIS software
- Be able to implement ESRI's ArcGIS in capturing, analyzing, and managing spatial and non-spatial data
- Be able to apply GIS in real world application such as demographic applications oil/gas pipeline data management, and implementation of geocoding in creating efficient route map

Study Plan

There are three aspects of the course: Lectures and tutorials, Lab exercises, and student projects.

Lectures and tutorials:

Students are required to attend lectures and complete selected tutorials from the getting to know ArcGIS workbook and other related tutorials designed by the instructor which will include weekly essay questions.

Lab Exercises/Team work:

The lab exercises are designed to provide the students with hands on experience of real world GIS implementation. The students will be provided a set of exercises on GIS applications to be completed. These will provide experience in the various facets of GIS implementation. These exercises will be handled in the same manner as you would in your workplace. You are required to complete these exercises on your own; however, you are welcome to ask me questions about them.

You will be required to complete the minimum number of exercises to be given by the instructor, which has to be passed by the instructor. Completed exercises will generally be submitted digitally unless otherwise required by a specific exercise.

Occasionally students will be required to work in a team

Student Project:

This will involve you gathering your own data and compiling a map and report. The topics for the project will be on GIS applications in your area of interest and it will basically be your assignment for the last three weeks of the term. A more detailed discussion of the student project will be made as the course progresses. Students are welcomed to suggest their own project topics.

Weekly Submissions

You are to submit the results of at least 1 tutorial or lab exercise each week along with typed answers to weekly essay questions.

Portfolios

You will compile your work for the course in a binder called the student portfolio. It will be made up of three sections. These are answers to your essay questions, your completed tutorials and laboratory exercises, and your student projects.

Required materials and Text Books

The course will implement the latest release of ESRI's ArcGIS software and ESRI's "Getting To Know ArcGIS" workbook.

Grades

Students will be assessed in all aspects of the course. Grades will be awarded for class tests, completed Lab exercises, project work, student's portfolios, and final examination. Exams will include questions from lectures and Lab work. A comprehensive make-up may be scheduled in the event of any legitimate exam absence. Grades will be awarded as follows:

Lab Exercises	20%
Class Tests and Essays	20%
Midterm	10%
Final Exams	10%
Student Project/Modules/Tutorials	30%
Class Participation	10%

Assignments Policy:

All assignments, homework, and project(s) are required to be submitted in a manner appropriate for college-graduating students. Check your grammar, spelling, etc.
Late work submitted will **NOT** be accepted and will be **recorded as zero**.

EGLSSS : EVALUATION FOR GREATER LEARNING STUDENT SURVEY SYSTEM

At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.

AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Support Services Office (DSSO) of the respective College at the beginning of each semester. Faculty is authorized to provide only the accommodation(s) requested by the DSSO.

If you have any questions, please contact Disability Counselor at your college

Central: John Reno 713.718.6179 & Andrea Hernandez 713.718.6331
Northeast: Kim Ingram 713.718.8420
Northwest: Mahnaz Kolaini 713.718.5422
Southeast: Jette Friis 713.718.7218
Southwest Dr. Becky Hauri 713.718.7910
District Office: Donna Price at 713/718-5165.

ACADEMIC HONESTY

Students are expected to complete all materials (exams & exercises) on their own. This does not prevent the student from seeking assistance from the instructor or other students. Copying/Modifying of assignments or cheating on exams will result in dismissal from this course and the student may be expelled from HCCS. Please refer to the current HCCS Student Handbook, Scholastic Dishonesty and Violations for further information.

DESCRIMINATION

Title IX of the Education Amendments of 1972 requires that institutions have policies and procedures that protect students' right with regard to sex/gender discrimination. Information regarding these rights is on the HCC website under Student-Anti-discrimination. Students who are pregnant and require accommodations should contact any of the ADA Counselors for assistance.

It is important that every student understand and conforms to respectful behavior while at HCC. Sexual misconduct is not condoned and will be addressed promptly. Know your rights and how to avoid these difficult situations.

Log in www.eduriskssolutions.org. Sign in using your HCC student email account, then go to the button at the top right that says Login and enter your student number.

SEXUAL HARASSMENT

It is a violation of HCC policy for an employee, agent, or student of the college to engage in sexual harassment as defined in the Equal Employment Opportunity Commission (EEOC) guidelines. Any student who has a complaint concerning this policy has the opportunity to seek resolution of such a complaint in accordance with procedures set forth in the student handbook. Report any complaints immediately to College Administration or call the institution Equity & Compliance Office 713.718.8271

ATTENDANCE AND WITHDRAWAL POLICIES

The State of Texas imposes penalties on students who drop courses excessively. Students are limited to no more than SIX total course withdrawals throughout their educational career at a Texas public college or university.

To help students avoid having to drop/withdraw from any class, HCC has instituted an Early Alert process by which your professor will "alert" you and Distance Education (DE) counselors that you might fail a class because of excessive absences and/or poor academic performance. Contact your DE professor regarding your academic performance or a DE counselor to learn about helpful HCC resources (e.g. online tutoring, child care, financial aid, job placement, etc.).

In order to withdraw from your DE class, you MUST first contact your DE professor, PRIOR to the withdrawal deadline to receive a "W" on your transcript. After the withdrawal deadline has passed, you will receive the grade that you would have earned. Zeros

averaged in for required coursework not submitted will lower your semester average significantly, most likely resulting in a failing grade of an "F". It is the responsibility of the student to withdraw from the class; however, your professor reserves the right to withdraw you without your request due to excessive absences. If you do not feel comfortable contacting your professor to withdraw, you may contact a DE counselor. However, please do not contact both a DE counselor and your DE professor to request a withdrawal; either one is sufficient.

The final withdrawal deadline should be listed in your syllabus (or can be found on the distance education website under the Academic Calendar link in the Current Student area). Classes of other duration (mini-term, flex-entry, 8-weeks, etc.) may have different final withdrawal deadlines. Please review HCC's online "Academic Calendars by Term" or contact Registrar's Office at 713.718.8500 to determine mini-term class withdrawal deadlines.