DATA ACQUISITION AND ANALYSIS IN GIS
GISC 2401-23301

Study **Independent-study, self-paced course**
Location: As needed - EMGI H105 or as agreed

Professor: J. Scott Sires
Office: EMGI H115
Office phone: 972-860-4362
Office hours: Monday None
Tuesday 12:20 p.m. – 3:20 p.m.
Wednesday 4:30 p.m. – 6:30 p.m.
Thursday None
Friday None
Email: ssires@dcccd.edu

Lab Coordinator: Jerry Bartz
Office: EMGI H105
Office phone: 972-860-4796
Open Lab: M T W R, 9:00 a.m. to 5:00 p.m.
Email: gbartz@dcccd.edu

Textbooks: Required text You, the student, choose and I approve. See details that follow.

COURSE INFORMATION
Number: 2401 Section: 23301 Credit Hours: 4

Description: Study of the management of geographic information, system life cycles, and costs and benefits. Includes institutional issues such as data providers, data management, combination of attribute and graphical data, information storage and access, Texas and national standards for spatial data; and applications of GIS for data modeling and analysis.

Prerequisites: Prior knowledge of applied geospatial technology.

Objectives: This course will provide the student with intermediate level concepts of applied geospatial technology. By completing this course, students will:
Link attribute data to spatial features.
Create, apply and demonstrate linking and embedding of external data sources.
Identify project elements, develop project scope, collect and prepare project data according to both audience and subject matter.
Manage the full life cycle for a GIS project.
Design and create spatially significant interpretations.
Manage properties for datums, coordinate systems and mapping projections.
Create and chronologically demonstrate spatially significant data.
Document the justification for project decisions and direction.
Coordinate GIS projects including cost estimates, timelines, and budgets. (KA9.2)
Continue professional education through credit and/or noncredit courses, technical training and information education, such as online courses. (KA10.2)
Create tables. (KA5.3)
Define the data requirements, research sources of available data, and purchase data from reputable source. (KA1.1)

Develop (and document with metadata) database(s) including: defining geometry, attributes, relationships, topology rules, feature behaviors such as subtypes and domains, incorporating data schema models. (KA1.2)

Determine data compatibility (projection), perform data conversion, populate feature attributes. (KA1.3)

Perform both tablet, COGO, and on-screen digitization with attribution. (KA1.4)

Perform quality control (QC) and quality assurance (QA) of GIS databases. (KA1.7)

Scan hard copy images into digital format. (KA2.1)

Geo-reference digital imagery. (KA2.2)

Maintain data QA/QC through update operations: (add/delete/change). (KA3.2)

Preprocess geographic data (generalize, subset). (KA4.3)

Organize file structure (e.g. create directories, perform data and directory housekeeping). (KA7.2)

Geocode data. (KA1.6)

Conduct spatial/nonspatial analysis. (KA4.1)

Perform geo-processing through clipping, buffering, overlay, etc. (KA4.4)

Create analysis report. (KA5.2)

Create maps. (KA5.1)

Interpret data results. (KA4.7)

Participate in GIS awareness events such as presentations, conferences and user groups. (KA9.5)

Description: GISC 2401 produces a single project compiled from several project elements. The finished project includes the study of the management of geographic information, system life cycles, and costs (time and materials) and benefits. Further the project will require the performance of institutional issues such as researching data providers, performing data management, the combination of attribute and graphical data, practice of file management, the application of national standards for spatial data, and applications of GIS tools for data creation, update, modeling and analysis.

Students are to interpret the location-based/spatial information (data, events, phenomena, trends) from the book they chose (and which they received instructor approval). Students are to create a single ArcGIS Online Story Map.

Details: The Story Map project will contain at least 10 logically ordered and named bookmarked location elements, and ArcGIS 10.2 mxd that contains at least 10 feature classes in appropriate feature datasets, 5 hyperlinks to a combination of both ancillary documents and to live websites, and 3 layouts (of these 3 layouts, 1 will be your keystone map).

In the Final Project Presentation and Participation students will demonstrate the Story Map within an active ArcGIS Online session on the GIS Lab instructor station; the Presentation of the Story Map will interpret the book. The demonstration must include both locational and non-locational information from the book. Students will use ArcGIS Online and the logically ordered bookmarked location elements to “walk through” the book. Students should organize the project understanding time as an element (what is the earliest date in the book and what is the last date) such that you can demonstrate the whole of the project. All 5 hyperlinks must be demonstrated during presentation after your first bookmark is applied and before your last bookmark is applied.

In order to complete a successful project that can be easily demonstrated please consider the following. Think of how a good story teller tells a story. What about your book makes a good story and how will you
tell your story. What parts of the book are highlighted at a particular location? What events are important because of their location? Consider the added analysis that is required; where is the center of the story, what is the overall area of influence in the story, within the overall area is there a cluster of density for the book events? Consider all the applied technology that can aid in the demonstration if your book content and events; use GIS, imagery, photography, internet web content, graphs, tables, on such materials. Also make sure you are NOT trying to teach GIS with your presentation, you are telling a detailed story and visually carrying the audience with you.

Students will copy, to their U Drive 2401 folder, their mxd project and feature datasets. The Story Map will be an application on the Brookhaven College ArcGIS Online Organization. The mxd project must have relative paths and must launch, on the instructor station, upon a double-click of primary file (.mxd file). Students will use layer properties to apply alias names that make sense to the audience, or to a professional environment. Student’s project data will be organized in a hierarchical folder array. All mxd data frames and layout legends MUST have appropriate names by setting the properties of the data frames and of the legends. Likewise the Story Map content must have logically named content. Students MUST turn in their book with their handwritten notations on each page as needed. THE BOOKS WILL NOT BE RETURNED, they are a permanent part of your turned in project. In their book, students MUST note (highlight, underline, and sidebar notes) on relevant pages, of the book you turn in, those items that are spatial attributes of your project. Cities might be points and will have dates relative to the time the book involves the cities. Rivers will be linear features that will also have a date attribute column, as well as a book page number attribute column, to tie each river feature to a time in the story and page in the book. Students MUST produce, as a part of the project documentation, an index of pages that contain spatial notations (a Microsoft Word document in table form). The spatial notations should be the most primary spatial locations of the book and most likely are very similar to your bookmarks. There should be many times and places of events of your book that have been highlighted and thus should be indexed in this list of spatial notations.

Suggested subject area: Travel, Adventure, History, Expedition, Discoveries

Book Characteristics: Approximately 200 pages (up to 300). Fiction or Non-fiction. Books with plots that detail a sense of place, location descriptive content. Interpretable books.

Suggested Book List:

- Into the Wild
- Touching the Void
- Sailing Alone Around the World
- The Story of the Titanic
- Travel’s with Charlie
- Lewis & Clark Expeditions
- Cannery Row
- Jack the Ripper
- The Other Wes Moore (BHC Campus Reader)

TO BEGIN: Visit the eCampus Spring 2014 GISC 2401-23301 site and look at the “Start Here” section. Keep in mind this is a 4 credit course where you are required to produce a project worthy of at least 96 contact hours. Students should think of this project as being a paid professional project in which they have 96 hours, over the next 16 weeks, to produce and present a professional applied geospatial technology project that interprets a book as discussed above. FIRST QUESTION: What is your adventure story? If you do not have one of your own I can help you identify a book and project.

FIRST TASK: Email instructor (ssires@dcccd.edu) regarding your project/book choice for approval. Identify the project in the terms of the five elements of GIS. This task should take no more than 1 hour of your time. Due by Friday, January 31st, 5:00 PM.
SECOND TASK: I prefer we all meet together to discuss the course, the syllabus and answer any questions in order to set expectations and thus help each student produce a complete and successful project. I propose we meet on campus, in the GIS Lab, next Tuesday, January 21st, 2014 at 6:40 PM (which follows the conclusion of a class at 6:30PM). I expect we will meet 2 to 3 hours. I will offer an alternative meeting if you have conflicts. If you have not already replied to my email Please contact me a.s.a.p. regarding your availability next Tuesday night.

THIRD TASK: Upon project and book approval, complete a 9-cell trigger document (template provided to you via eCampus in the “Content” section). To complete 9-cell think through the effort expected to complete the project; remember 96 hours is the minimum number of contact hours. Students must demonstrate attention to detail. Also write an executive summary using generalized technical vocabulary and language. The summary must be in the form of a business letter, addressed to me (J. Scott Sires) at my address on campus (Brookhaven College, Geotechnology Institute, 3939 Valley View Lane, Farmers Branch, TX, 75244). In three paragraphs explain first the book and the adventure or story. In the second paragraph you will identify three technical processes or technical tasks you will accomplish (collect data, build project and create and ArcGIS Online Story Map) to “show” this story. In the third paragraph you will discuss your expected presentation of the project and the expected benefit, what will people get from the project. Complete thoughts and professionalism of the letter will count in your assessment. Again attention to detail will count. Due (9-cell and executive summary) via email by Friday, February 7th, 5:00 PM.

FOURTH TASK: Read your book and create a GIS project. Note on each page of the book the primary physical locations, events and phenomena you will include in your data development. You may underline, asterisk, highlight, these things. Each of these page notes will need to be an attribute to some data feature within your geodatabase. Document, acquire and assemble data as identified in the 9-cell grid in order to develop a project that includes an ArcMap 10.2 “mxd” file and matching data set. The data geometries must demonstrate attention to detail and high quality editing performance. Within the mxd use logical symbology for included datasets. Do not leave unneeded data sets in the final project (the mxd). You can leave them in the data folder and acknowledge, in the data dictionary, why they were not used in the final project (ie: “How the data was improved to a new version?”). This task includes editing, collecting, scanning and georeferencing, development of bookmarks and hyperlinks.

The project task includes more than just data development and symbolization; the project requires some form of data analysis. The data analysis is something that you, the GIS Student, creates and adds to the project.

Create the ArcGIS Online Story Map. Refer to the whitepaper loaded in our eCampus course shell. The document explains a story map. The attributes for the various feature classes will become pop-ups and other elements of the story map.

All the results of this task are to be turned in with the final project as a cascade (of folders) from a single parent data folder. In the U drive you will have: U:/yourlastname/GISC2401/FinalParentFolder. The data set must be logically named and explained in a data dictionary (Microsoft Word document) that identifies each database, data set, data class and project-specific fields. For primary attribute fields state acceptable values and ranges; if a range of values does not exist simply explain the data variable. Within all feature dataset attribute files you must add an attribute column that contains the page number, or numbers, of the book that correspond to the feature. Include in the single parent project folder all that you have produced – even that which has been turned in to date. Due (single parent project folder containing an mxd file project, data-folder, data, documents including dictionary, 9-cell, executive summary) by Thursday, May 8th, 2014 by (meaning before) 10:00 AM.

FIFTH TASK: Create and export 3 layouts showing the most substantial events or places in the story and, or views that you think address the importance of the story; the spatial content with which you identified. These layouts will be presented to your panel of peers and should contain the minimum required map elements. Students must create 2 layouts and export each to a single map (as a 200 dpi, tabloid sized (11” X 17”)) adobe pdf or tiff format file. The third layout (exported map) is a large (at least 24” X 36” up to
36” X 40”) keystone map. This map will most likely involve some work with Adobe creative suite which we have in the lab. There will be sample keystone maps loaded for you to eCampus in the “Content” section. The keystone maps may (I select my favorite) be taken to the annual Esri International User Conference this July 2014. The keystone map is a highlight of the book and of the GIS project and of the student’s interpretation. The 3 layouts are Due as softcopy (you do not need to plot) by Thursday, May 8th, 2014 by 10:00 AM, within the content copied to the U Drive 2401 folder and included in your final project presentation to the panel of peers (i.e. show each layout at some point in your presentation).

SIXTH TASK: Participate in the Thursday, May 8th, 2014 GIS final project presentations. Beginning at 10:00 AM each student will have a maximum of 15 minutes to use the instructor station to demonstrate the ArcGIS Online Story Map. All presentations are to be delivered between 10:00 AM and 2:00 PM that same day. NO DATA OR PROJECT DELIVERABLES WILL BE ACCEPTED AFTER 10:00 AM. Each student is expected to attend the full four hours in order to participate in the full GIS Presentation ‘event’. There will be students from other classes also presenting. This is required! Make plans now for time off work.

OPTIONAL TASK: Request meetings and or attend campus labs for instructional support.

Notes:
- Build a GeoDataBase – required data delivery format is file geodatabase containing all feature data sets and feature data classes.
- Index notes in book – required to create a table document of the pages and relative content.
- Manage time to get reading and notation completed EARLY.
- Bibliography of ALL data is required as a part of the data dictionary and will turned in as a part of project documentation.

Recommendations: Industry periodicals and web-sites as mentioned throughout the course.
- Storage device; to be used in this class as well as all other program courses.

Assessments:

<table>
<thead>
<tr>
<th>Task</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary and 9-cell project overview</td>
<td>10% - 140 points</td>
</tr>
<tr>
<td>2 small layouts</td>
<td>10% - 140 points</td>
</tr>
<tr>
<td>Keystone layout</td>
<td>10% - 140 points</td>
</tr>
<tr>
<td>Geodatabase, data index doc, and data dictionary</td>
<td>30% - 420 points</td>
</tr>
<tr>
<td>ArcGIS Online Story Map with Pop-ups</td>
<td>30% - 420 points</td>
</tr>
<tr>
<td>Final Project Presentation and Participation</td>
<td>10% - 140 points</td>
</tr>
<tr>
<td>Total possible course points</td>
<td>1400 points</td>
</tr>
</tbody>
</table>

Attendance:
- This is an independent study course and is self paced. Thus there are no required weekly class lectures; however we do have 2 scheduled on campus meetings. We need to meet in week 2 to discuss the scope of the course requirements and then we meet again at the end of the semester (the week BEFORE Finals) to conduct the student presentations. You are expected to request and attend meetings and labs as needed. It is your responsibility to withdraw from this course if necessary. If you stop attending class your final grade will be determined as shown in the above “Assessments” with zeros for all grades missed.

ADA Statement:
- If you are a student with a disability and/or special needs who requires accommodations, please contact the college Disability Services Office.

Religious Holidays:
- Absences for observance of a religious holy day are excused. A student whose absence is excused to observe a religious holy day is allowed to take a make-up examination or complete an assignment within a reasonable time after the absence.
Academic Dishonesty: Scholastic dishonesty is a violation of the Code of Student Conduct. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion. As a college student, you are considered a responsible adult. Your enrollment indicates acceptance of the Dallas County Community Colleges Code of Student Conduct published in the Dallas County Community Colleges Catalog. https://www1.dcccd.edu/cat0506/ss/code.cfm

Pay specific attention to Pages 3 of 5 and 4 of 5 of the STUDENT RIGHTS AND RESPONSIBILITIES, STUDENT CONDUCT, item number 11 defines how we define cheating.

Withdrawal Policy: If you are unable to complete this course, it is your responsibility to withdraw formally. The withdrawal request must be received in the Registrar’s Office by Thursday, April 17, 2014. Failure to do so will result in your receiving a performance grade, usually an “F”. If you drop a class or withdraw from the college before the official drop/withdrawal deadline, you will receive a “W” (Withdraw) in each class dropped.

Six Drop Issue: STOP BEFORE YOU DROP

For students who enrolled in college level courses for the first time in the fall of 2007, Texas Education Code 51.907 limits the number of courses a student may drop. You may drop no more than 6 courses during your entire undergraduate career unless the drop qualifies as an exception. Your campus counseling/advising center will give you more information on the allowable exceptions. Remember that once you have accumulated 6 non-exempt drops, you cannot drop any other courses with a “W”. Therefore, please exercise caution when dropping courses in any Texas public institution of higher learning, including all seven of the Dallas County Community Colleges. For more information, you may access: https://www1.dcccd.edu/coursedrops

Repeating this course: Effective for Fall Semester 2005, the Dallas County Community Colleges will charge additional tuition to students registering the third or subsequent time for a course. All third and subsequent attempts of the majority of credit and Continuing Education/Workforce Training courses will result in additional tuition to be charged. Developmental Studies and some other courses will not be charged a higher tuition rate. Third attempts include courses taken at any Dallas County Community Colleges since the Fall 2002 Semester.

Geo Lab Policies: Food IS allowed in the Geo lab but you take responsibility for any property damage that results from your food or drink; regardless of how the damage occurred. Drinks ARE allowed in the classroom, WITH TIGHT FITTING LIDS ONLY, but you take responsibility for any property damage that results from your food or drink; regardless of how the damage occurred. With respect to any food you consume in lab, the cleanliness of our lab is also your responsibility. Your PC and desk are your responsibility; please keep them clean so we all benefit from the best environment.

Cell Phones are to be silent at all times within the lab. Cell phones are not to be used during class lecture nor can they used during labs. Cell phones and pagers are no longer allowed in the Testing Center.

Etiquette will be observed at all times in the classroom. We will not tolerate students talking over the instructor, other students or guests.
At no time may a student touch the keyboard or other input devices on any PC except their own UNLESS prior approval of a PC user; ASK FIRST!
At no time will a student remove, delete or erase any files from any PC other than files they have created on the PC they are using at that class time. Each lab PC is WIPED OUT EACH NIGHT! Only the content of our Geo Lab Server is maintained.
At no time will a student write-over an existing file on any PC other than on the PC they are using at that class time.
At all times all students will respect shared devices and data.
Students will prepare for class as needed and directed. BEING UNPREPARED or late results in a disruption to the lesson and content delivery and will result in reductions in participation and or lab grade for the student causing the delay.
Students will participate in class discussions and will NOT perform non-geospatial technology program work, will not email beyond that needed for support of our classes, will not surf the internet nor perform other activities during class EXCEPT related to the course of study.
Behavior unacceptable to the instructor will result in removal of the student from class.

U drive folder structure

Copy of ArcGIS – provided by BHC.

If you are receiving Financial Aid grants or loans, you must begin attendance in all classes. Do not drop or stop attending any class without consulting the Financial Aid Office. Changes in your enrollment level and failing grades may require that you repay financial aid funds.

Cell phones and pagers are no longer allowed in the Testing Center.

**COURSE EDUCATIONAL OBJECTIVES**
1. Understand and apply methods and appropriate technology to the study of the geospatial technologies.
2. Recognize geographic and quantitative methods and the differences between these approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing.
3. Identify and recognize the differences among competing geographic theories.
4. Demonstrate knowledge of the major issues and problems facing geospatial technologies, including issues that touch upon ethics, values, and public policies.
5. Demonstrate knowledge of the interdependence of geospatial technology and their influence on, and contribution to modern culture.

**COURSE INTELLECTUAL COMPETENCIES**
1. Reading – The ability to analyze and interpret a variety of printed materials – books, documents, and articles.
2. Writing – The ability to produce clear, correct and coherent prose adapted to purpose, occasion and audience.
3. Speaking – The ability to communicate orally in clear, coherent and persuasive language appropriate to purpose, occasion, and audience.
4. Listening – Analyze and interpret various forms of spoken communication, possess sufficient literacy skills of writing, and reading.
5. Critical Thinking – Think and analyze at a critical level.

Right to Change syllabus: The instructor reserves the right to amend this syllabus as necessary.