FORS 6377
Advanced Mobile and Field GIS
Summer 2021

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Office: Forestry 106
Office Hours: Monday - Friday, 8:00AM–5:00PM via email
Department: Forestry
Class meeting time and place: Monday through Thursday, all day in D2L
Website: http://www.faculty.sfasu.edu/hungikua

Course Description:
FORS 6377 Advanced Mobile and Field GIS. Three semester hours. GIS data management with focus on building geodatabase and field mapping and inventory using mobile GPS/GIS devices. Students will be working on projects related to GIS data collection and processing using GIS/GPS. Prerequisites: GISC 5351. Course fee required.

Program Learning Outcomes:
Geographic Information System (GIS) is a computer system for the management, analysis and display of geographic information. Facilitated with global positioning system (GPS) and/or wireless Internet, a mobile GIS allows for capturing, storing, updating, manipulating, analyzing, and displaying geographic information in the field.

This course is a selective course for Spatial Science, Forestry, and Environmental Science majors. The course is designed to Program Learning Outcomes in understanding the competency of database management, resource measurement, management and oral and written communication skills at advanced level.

Student Learning Outcomes:
Students will demonstrate competency in building a well-designed geodatabase that is able for GIS data check-out to edit in the field with maximum data integrity, and then check-in back to the office database for synchronization. They will learn not only the sophisticated Mobile GIS software but also the necessary background to understand how the software package works. In the meantime, they will learn to operate handheld GIS/GPS devices and collect data in the field. As the semester develops, the students will also understand professional ethics and demonstrate competency in oral and written communication skills through project preparation and presentation at advanced level.

Text and Materials:
References:

Software:
Esri: ArcGIS Pro, ArcGIS Online, ArcGIS Earth, Collector, Survey 123
Google: Google Earth, Google Maps, Google Sites
Others: Gaia GPS, AppSheet

Hardware:
VMware Horizon at https://view.sfasu.edu/
A smart phone of your own, iPhone or Android, BYOD (bring your own device)

Course Outlines:

ArcGIS Pro: ArcGIS Pro is the new generation of desktop GIS in the ArcGIS suite. It consolidates multiple applications into one single interface. ArcGIS Pro works with a variety of GIS data formats, connects to different types of servers, and works seamlessly with ArcGIS Online.

GIS Data and GNSS: Regardless the data format, a GIS dataset must be referenced to a coordinate system to be placed on the right location. A global navigation satellite system (GNSS) is a system allowing for calculating the use’s current location based on satellite signals received. The global positioning system (GPS) is the one that is commonly used.

ArcGIS Online: ArcGIS Online is an online platform for GIS data creation, editing, collaboration, publishing, and sharing. It works with desktop and mobile GIS applications through internet connection. Data can be synchronized between a local device and the online database in real time.

Web GIS and Geotagging: Geotagging is the process of adding geographical identification metadata to various media such photos and videos. A geotagged image can be displayed in a GIS map based on its geographic coordinates, and the map often comes as a web page accessible on the internet.

RDBMS and Geocoding: Relational database management system (RDBMS) is a collection of tables that are linked to each through a key field on each table. Geocoding is the process of converting text-based postal data into digital geographic coordinates (i.e., longitude and latitude). Once geocoded, features can be created based on the geographic coordinates assigned.

Geodatabase and Offset Feature Collection: A geodatabase integrates all the needed spatial data and tabular data into a signal depository. With built domains, subtypes, and relationships, attributes data entry becomes more efficient and error preventive. Offset feature collection is used in GPS operation without physically accessing a feature. Instead, it measures distance/direction from a reference point where the geographic coordinates are captured with GPS.

Differential Correction and Story Map: Differential correction makes adjustment on GPS coordinates based on permanent reference locations with known coordinates to increase positional accuracy. It can be done real time or through post processing. When features are placed on a digital map, each linked to its photo(s) and its description, it becomes a story map.

Desktop, Mobile, and Server GIS: With a GIS database built on a desktop application and published online, or built straightly on the online server, field data collection can be done using a mobile device such as a smart phone or a tablet. Data synchronization can be applied real time with internet collection at all times or throughout offline operation.
Course Requirements and Grading Policy:

- Assignments (72%)
  A total of eight lab assignments. A website built for these assignments will be evaluated at an advanced proficiency level.

- Quizzes (8%)
  A total of eight quizzes, one for each module.

- GIS Tips and Tricks (10%)
  The student will record a 10 minute oral presentation video for the submission. The presentation is about the manipulation, functionality, processing etc. of GIS that the student has discovered in the software and/or online applications. Doing the presentation facilitated with visual aid such as PowerPoint and GIS/GPS demonstration is required. The deadline for submission is July 19, 11:30PM. This presentation will be evaluated at an advanced proficiency level.

- Final Exam (10%)
  An online final exam scheduled for July 23, 8:00AM-12:00PM. It will have both written questions and data processing questions.

Brightspace (Desire2Learn) Online System:

The contents delivery and electronic communication of this course will be done through the Desire2Learn (D2L) online system at http://d2l.sfasu.edu. It includes email, course materials delivery, assignment submission, quizzes, etc. It is the student’s responsibility to check for email announcements, data availability, and deadlines in D2L. When uploading assignments, the name of the student’s file should include the student’s mySFA ID at the end following an underscore, e.g. assignment1_hungiku. Failure to following this filename convention will result in penalty on the grade. A corrected version of assignment can be resubmitted by the deadline. However, no late submission will be accepted.

For D2L technical support, contact student support in the Office of Instructional Technology (OIT) at d2l@sfasu.edu or 936-468-1919.

Attendance Policy:

According to the University’s policy, regular and punctual attendance is expected at all classes, laboratories, and other activities for which a student is registered. Even though attendance is not a factor for the course grades, accurate attendance will be recorded. When an absence is unavoidable, make sure you catch up on what was missed. If a student has excessive absences, the instructor reserves the right not to give individual tutoring, special consideration regarding make-up work, or other help the student needs because of missing class. Plan your time as best as possible and make the commitment to spend the amount of time needed for you to be successful.

Acceptable Classroom Behavior:

Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Code of Conduct, policy 10.4). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all in-
structional forums, including electronic/online forums, classroom meetings, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program http://www.sfasu.edu/judicial/earlyalert.asp. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

Responsible Use of Technology:
It is expected that all students will only use cell phones, PDAs, laptop computers, MP3 players, and related devices outside of class time or when appropriate in class. Answering a cell phone, texting, listening to music or using a laptop for matters unrelated to the course may be grounds for dismissal from class or other penalties.

Academic Integrity:
It is the instructor’s hope that academic dishonesty will not be a problem in this class. However, academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit. Please read the complete policy at http://www.sfasu.edu/policies/4.1-student-academic-dishonesty.pdf.

Withheld Grades Course Grades Policy (5.5):
At the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F, except as allowed through policy [i.e., Active Military Service (6.14)]. If students register for the same course in future semesters the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.
Students with Disabilities:
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

Mental Health:
SFASU values students’ mental health and the role it plays in academic and overall student success. SFA provides a variety of resources to support student’s mental health and wellness. Many of these resources are free, and all of them are confidential.

On-campus Resources:
SFASU Counseling Services
www.sfasu.edu/counselingservices
3rd Floor Rusk Building
936-468-2401

SFASU Human Services Counseling Clinic
www.sfasu.edu/humanservices/139.asp
Human Services Room 202
936-468-1041

Crisis Resources:
Burke 24-hour crisis line 1(800) 392-8343
Suicide Prevention Lifeline 1(800) 273-TALK (8255)
Crisis Text Line: Text HELLO to 741-741
## Calendar: Summer 2021

<table>
<thead>
<tr>
<th>Month</th>
<th>Day</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>June</td>
<td>28</td>
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| 2     |      | 29    | Intro to ArcGIS Pro  
Lab 1. Map Composition in ArcGIS Pro |
| 3     |      | 30    | GIS Data Formats and Coordinate Systems |
| 4     | July | 1     | Global Navigation Satellite Systems  
Lab 2. Field Data Collection with GPS |
| 5     |      | 5     | Intro to ArcGIS Online |
| 6     |      | 6     | Access ArcGIS Online via Mobile Apps  
Lab 3. Data Collection with Collector |
| 7     |      | 7     | Web GIS |
| 8     |      | 8     | Geotagging  
Lab 4. Geotagging and Web Maps |
| 9     |      | 12    | Relational Database Management System |
| 10    |      | 13    | Geocoding  
Lab 5. Geocoding |
| 11    |      | 14    | Geodatabase for Mobile Deployment |
| 12    |      | 15    | Offset Feature Collection  
Lab 6. Geodatabase for GPS Data Collection |
| 13    |      | 19    | Differential Correction  
Tips and Tricks Presentation due |
| 14    |      | 20    | Story Map  
Lab 7. Survey 123 and Story Map |
| 15    |      | 21    | Bridging Desktop and Server GIS |
| 16    |      | 22    | Mobile GIS Online  
Lab 8. Mobile Apps with Google Sheets |
| 17    |      | 23    | **Final Exam (8:00AM-12:00PM)** |