

Course Title: Data Acquisition and Management

Course Number (If applicable): GST 103

COURSE DESCRIPTION: This course addresses the interpretation and understanding of a variety of data formats available in a geographic information system (GIS). It introduces the fundamental concepts of primary GIS data creation and discusses quantitative techniques for collection, classification, and management of geographical data. Course content is based upon the United States Department of Labor's Geospatial Technology Competency Model for entry level geospatial occupations including Geospatial or GIS Technicians and Technologists.

PREREQUISITES: Basic computer literacy required; Completed courses: GST 101, GST 102.

REQUIRED MATERIALS: ArcGIS Desktop 10.1.

ADDITIONAL RESOURCES (if applicable):

LEARNING OUTCOMES/COMPETENCIES:

1. The student will describe the collection of field data, digital conversion of existing hardcopy maps, and the construction of spatial data from known locations.
2. The student will demonstrate basic proficiency to collect, record, and utilize spatial data and databases.
3. The student will demonstrate an ability to collect, create, and process spatial data within a variety of environments.
4. The student will describe and explain the similarities and differences between data models as well as how data is treated differently within each format, to include the conversion of data between different formats.
5. The student will demonstrate an understanding of the fundamentals of GIS data storage and interoperability.

COURSE ASSESSMENT:

Grading Scale


Category	Weight
Laboratories	50%
Quizzes	10%
Examinations	40%
Final Grade	100%

Total Points	Percentage	Grade
	90% – 100%	A
	80% - 89%	B
	70% – 79%	C
	65% - 69%	D
	0% - 64%	F

COURSE SCHEDULE:

Note: This partial example shows a course that combines lecture and lab components.

Module/ Lesson	Module/Lesson Title & description (if applicable)	Learning Outcomes	Assignment (w/category & point value)
1.	Reviewing the Basics of Geospatial Data	<ul style="list-style-type: none"> • Define basic data acquisition and management terms. • Describe the basics of geospatial data organization. • Format raster and vector data. • Differentiate between a hierarchal, network, and relational database. 	Module 1 Lab – 7.1 pts. Module 1 Quiz – 1.43 pts.
2.	Basic Database Design	<ul style="list-style-type: none"> • Define basic database design terms. • Create a database schema. • Import and export a database schema. • Design a relational database. 	Module 2 Lab – 7.1 pts. Module 2 Quiz – 1.43 pts.
3.	Database Schema Implementation	<ul style="list-style-type: none"> • Define key terms relating to implementing database schemas. • Implement subtypes and domains, primary and foreign keys, data validation, relationships, and other geodatabase tools. 	Module 3 Lab – 7.1 pts. Module 3 Quiz – 1.43 pts.
4.	Vector Data Structure	<ul style="list-style-type: none"> • Define key terms relating to the structure of a vector data, vector data models, and topology. • Describe the nature of geometry and its relationship to both topological and non-topological features. 	Module 4 Lab – 7.1 pts. Module 4 Quiz – 1.43 pts. Exam 1 – 20 pts.
5.	Spatial Data Quality	<ul style="list-style-type: none"> • Define key terms relating to the accuracy and quality of spatial data, locational errors, and data aggregation. • Identify and review data in accordance with the National 	Module 5 Lab – 7.2 pts. Module 5 Quiz – 1.43 pts.

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		Standards for Spatial Data Accuracy. <ul style="list-style-type: none"> Identify and edit locational errors from primary/secondary data sources, recognizing the challenges associated with raster and vector data aggregation. 	
6.	Raster Data Structure	<ul style="list-style-type: none"> Define key terms relating to types of raster data, storing data, managing raster attributes, resampling techniques, and integer and float grids. Compare rasters and vectors. Describe the methods of storing raster data and how attributes are managed within a raster data model, to include the differences between integer and floating point values. 	Module 6 Lab – 7.2 pts. Module 6 Quiz – 1.43 pts.
7.	Data Sources	<ul style="list-style-type: none"> Define key terms relating to digitizing, data sources, and geocoding. Build and collect primary spatial data by way of scanning, digitizing, geocoding, or similar methods. Identify and use data from public sources. Create a map. 	Module 7 Lab – 7.2 pts. Module 7 Quiz – 1.43 pts. Exam 2 – 20 pts.