Syllabus

Course Title: Spatial Analysis	**Course Number** (If applicable): GST 102

COURSE DESCRIPTION: Introduces students to problem-solving and decision making using geospatial analysis techniques, applicable to a range of disciplines.

PREREQUISITES: Introductory course in GIS, such as GST 101 – Introduction to Geospatial Technology; basic computer literacy required; college algebra recommended.

REQUIRED MATERIALS: ArcGIS Desktop 10.1

ADDITIONAL RECOMMENDED RESOURCES (if applicable):

Bolstad, Paul. "GIS Fundamentals: A First Text on Geographic Information Systems". 4th Edition. Eider Press.

LEARNING OUTCOMES/COMPETENCIES:

1. The student will be able to prepare data for use in analysis.
2. The student will be able to determine an appropriate approach to solving a problem or answering a question using geospatial tools and methods.
3. The student will be able to run geoprocessing tools individually and implement a model to run several tools in sequence.
4. The student will be able to organize the data sets resulting from analysis.
5. The student will be able to present the results of a geospatial analysis using appropriate terminology and visualizations.

COURSE ASSESSMENT:

Grading Scale

Category	Weight
Laboratories	50%
Quizzes	5%
Examinations	30%
Final Project	15%
Final Grade	**100%**

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

COURSE SCHEDULE:

Module/ Lesson	Module/Lesson Title & description (if applicable)	Learning Objectives	Assignment (w/category & point value)
1.	**Topic:** Reviewing the basics of geospatial data	• Identify basic geospatial data elements. • Explain the various coordinate systems and their importance. • Differentiate vector and raster data formats.	Module 1 Lab – 6.25% Module 1 Quiz – .6%
2.	**Topic:** Introduction to geospatial analysis	• Explore data relationships using geospatial data. • Create simple data sets using a table operation method. • Classify quantitative data using a variety of statistical methods. • Create a scatter plot of data. • Analyze scatter plot data to produce presentation of results.	Module 2 Lab – 6.25% Module 2 Quiz – .65%
3.	**Topic:** Using attribute and spatial queries for data exploration	• Perform advanced query to prepare data for use in analysis. • Use a data dictionary to decipher coded data. • Determine how to use queries to address a question.	Module 3 Lab – 6.25% Module 3 Quiz – .6%
4.	**Topic:** Vector data analysis: overlay techniques	• Identify vector data analysis overlay techniques. • Convert coverage data format to a modern GIS data format. • Explain how environmental settings are used to enhance data organization.	Module 4 Lab – 6.25% Module 4 Quiz – .65%
5.	**Topic:** Vector data analysis: creating a site selection model	• Identify elements of vector data analysis used for creating a site selection model. • Apply the method of proximity analysis for buffering elements. • Develop a model that satisfies multiple location criteria.	Module 5 Lab – 6.25% Module 5 Quiz – .6% Exam 1 – 15%
6.	**Topic:** Vector data analysis: network analysis	• Prepare vector data sets for use in network routing. • Apply network techniques to create efficient routes including impedances. • Generate service areas based on network analysis.	Module 6 Lab – 6.25% Module 6 Quiz – .65%
7.	**Topic:** Raster data analysis: working with topographic data	• Create slope, aspect, and hillshade surfaces using raw elevation data. • Analyze environmental issue using elevation and derived data sets. • Reclassify raster data and use in and use in a map algebra-based model. • Apply viewshed analysis to enhance site selection.	Module 7 Lab – 6.25% Module 7 Quiz – .6%

8.	**Topic:** Raster data analysis: density surfaces	• Construct data density surfaces from point data using appropriate methods. • Convert between vector and raster formats. • Develop approach to address questions using density techniques.	Module 8 Lab – 6.25% Module 8 Quiz – .65% Exam 2 – 15%
9.	Final Project	• Solve a problem using geospatial technology. • Create data using electronic methods.	Final Project – 15%