Fall 2017 Introduction To Geographic Information Systems

You can solve spatial problems!

http://dverbyla.net/nrm338/

3 credits: 2 lectures, 1 computer lab per week

Lectures: Tuesday/Thursday, 9:45-11:15am Reichart Building Room 202

Lab: Tuesday 2-5PM ONeill 359

or Weds 11:15AM-2:15PM ONeill 359

Instructor: Dave Verbyla, Professor, ONeill Building, Room 368

Phone: 474-5553 (but Email is much preferred instead of telephone tag!)

Email: dlverbyla@alaska.edu.

Dave's Office Hours: ONeill 368 Mondays 1-2pm or by email appointment..

Teaching Assistant: Dina Abdel-Fattah Email: dabdelfattah@alaska.edu

Course Description: This course is designed for geographers, wildlife biologists, fisheries biologists, ecologists, natural resource managers, geologists and field-oriented professionals who use spatial technologies in their jobs. Spatial technogies are especially important in Alaska, where road-access is typically limited. Our emphasis in this course is on obtaining and using Alaskan geographic data.

I can provide you with a student-version of ArcGIS if you own a windows-based computer.

If you want, you can use your own computer during lab. Also you can work with a partner in lab.

Welcome Video Clip

Course Objectives:

1) To learn how to solve spatial problems using GIS.

2) To understand basic concepts independent of any particular software.

3) To learn ArcMap GIS through hands-on computer lab exercises.

4) To learn how to download and used Alaskan geospatial data.

Grades Based on total points as follows:

- **12 blackboard-based quizzes (https://classes.alaska.edu/) 20 points each = 240 points**

    o **Quiz 1 Due Tuesday 12-Sept-2017 5pm**

    o **Quiz 2 Due Tuesday 26-Sept-2017 5pm**

    o **Quiz 3 Due Tuesday 3-Oct-2017 5pm**

    o **Quiz 4 Due Tuesday 10-Oct-2017 5pm**

    o **Quiz 5 Due Tuesday 17-Oct-2017 5pm**

    o **Quiz 6 Due Tuesday 24-Oct-2017 5pm**

    o **Quiz 7 Due Tuesday 31-Oct--2017 5pm**

    o **Quiz 8 Due Tuesday 7-Nov-2017 5pm**

    o **Quiz 9 Due Tuesday 14-Nov-2017 5pm**

    o **Quiz 10 Due Tuesday 21-Nov-2017 5pm**

    o **Quiz 11 Due Tuesday 28-Nov-2017 5pm**

    o **Quiz 12 Due Tuesday 5-Dec-2017 5pm**

- **On-line Mid-Semester Exam= 100 points**

- **On-line GIS Final Exam: 100 points**

- **Class Participation: 100 points**

- **Total points possible = 540 points**

Final grades will be based on total points earned in the course as follows:

> 485 total points = A

445 to 485 total points = B

400 to 444 points = C

350 to 399 total points = D

< 350 total points = F

Disability Services: We will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to to any student with a disability.

Please inform us the first week of class if you have a disability that we should be aware of.

Textbook: None---weekly web site readings

Fall 2016 Schedule			
Date	**Lectures**	**Thursday's Spatial Problems**	**Lab**
Aug 28 - 31	Course Overview Course Learning Map Demo lab1	Week1 Spatial Problems	Lab1: Introduction to ArcGIS
Sept. 5-7	Five Dimensions of GIS: • **Location** • **Distance** • **Measures** • **Depth** • **Time**	Week2 Spatial Problems	Lab2: Five Dimensions of GIS
Sept. 12-14	GIS Coordinates and Projections Youtube lectures: 1) Geographic Coordinate Systems 2) Horizontal Datums 3) Alaska Albers NAD83 Coordiantes 4) UTM NAD83 Coordinates	Week3 Spatial Problems	Lab 3: GIS Coordinate Systems and Projections

	5) Alaska State Plane NAD83 Coordinates		
Sept. 19- 21 No Class or Lab this Week!			
Sept. 26- 28	GIS Features (points,lines,polygons) Youtube video sessions: 1. Point Feature Classes in ArcGIS 2. Polyline Feature Classes in ArcGIS 3. Polygon Feature Classes in ArcGIS	Week4 Spatial Problems	Lab 4: GIS Feature Data Formats
Oct. 3-5	GIS attribute tables Youtube session: 1. Stand-alone tables in ArcGIS	Week5 GIS Tables Problems	Lab 5: Tabular Analysis
Oct. 10-12	Editing shapefile points, lines, polygons Youtube video sessions: Arcmap hyperlinks Editing points, lines, polygons	Week6 Editing GIS Problems	Lab 6: Editing Shapefiles
Oct. 17-17	Geodatabases Youtube video sessions: 1. Geodatabase Containerin ArcGIS	Week7 Geodatabase Problems	Lab 7: Geodatabases

	2. Range and Coded Domains 3. Feature Dataset Topology		
Oct. 24 - 25	Example mid-semester exams	GIS Exam Problems:	Mid-Semester Exam during lab
Oct. 31- Nov. 2	Raster Surprises Elevation Rasters Youtube lectures: 1) Processing Digital Elevation Models 2) Elevation Geoprocessing Analysis	Elevation Raster Problems	Lab 8: Elevation Rasters
Nov. 7-9	Georeferencing Rasters Youtube video sessions: 1. Georeferencing Model 2. ArcMap Georeferencing Toolbar	Georefererencing Problems -	Lab 9: Georeferencing Rasters
Nov. 14-16	Supervised Classification Youtube video sessions: 1. Supervised Classification 2. Estimating Classification Accuracy	Image Classification Problems	Lab 10: Raster imagery: classification and accuracy assessment
Nov. 21-22	Feature Analysis Youtube video sessions: 1. Distance Geoprocessing Tools 2. Overlay Geoprocessing Tools	Thanksgiving Holiday !	Lab 11: Feature Analysis

Nov 28 - 30	**Map Layouts :** Map Layout For Landscape Change Animation Time enabled layers: Alaska Wildfires Since 2000 Study area Map Layout	**Feature Analysis Spatial Problems**	**Lab 12: Map Layout**
Dec. 5-7	**Example Final Exams :** Practice Final 1: Invasive Weed Locations Along Haul Road Practice Final 2: Barley Fields Mean Soil pH and Yield Practice Final 3: Shorebirds Mean Distance to Low Tide Line Practice Final 4: Churchill River KM By Province **Class evaluations**	**Final Exam durng lab**	**Final Exam durng lab**

Email: Dave Verbyla (dlverbyla@alaska.edu.edu).