Advanced GIS - Class Overview (Fall, 2014)

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| Course Description  Advanced GIS is a fast-paced class to introduce principles of geospatial science and expose students to many of the recent technology innovations in Geographic Information Systems. The field of GIS is rapidly evolving from a traditional desktop workstation into the cloud environment. Students will follow that progression by learning the essentials of ArcMap for Desktop and how to use Desktop to manage data, create layers, maps, and reports, and perform basic spatial analysis. Students will create and publish their maps and layers from the Desktop into the cloud, using Evergreen’s subscription account to ArcGIS Online. Various elements of the ArcGIS (Esri) platform will be used during the class.  Online maps can be shared with fellow students, teachers, and to the general public. Some introductory maps and data can be seen at <http://geoduck.maps.arcgis.com>.  The general approach is “learn-by-doing”. The field of GIS is a broad and growing discipline. The essential skills can usually be learned through structured interaction with GIS software and spatial data sources. Evergeen maintains licenses for students to the suite of GIS products from Esri ([www.esri.com](http://www.esri.com)).  Students are encouraged to bring their laptop computers, check out and install ArcMap software, and use any convenient combination of computing resources for accomplishing the homework and project work for this course. Teamwork and collaboration among students are highly encouraged.  The textbook is oriented to hands-on exercises with short readings. The exercises will serve as step-by-step scripts, to help students learn critical skills. Students will then apply their skills to complete their own weekly map-production assignments using some geodata from the Olympia area.  **Final Project**  Throughout the quarter, students will work in pairs on a mapping project for presentation to their peers at the end of the session. Students will consider what “problem” or question is their map trying to answer? What types and sources of data will help you address your question? What are the lines of analysis that you need to apply to the data to show the logic of your solution? How do you communicate the results of your analysis in a way that others will find intuitively clear and aesthetically pleasing? And, finally, how do you share your findings, with the class members, with the College, or possibly with the world, so that others can benefit from your work? |

**Homework**

There will be significant homework assignments. I estimate 8 to 12 hours a week of hands-on exercises and weekly progress on your culminating project. For those who want to learn more, I will provide “challenge” guidelines, including videos, extra selected readings and pointers to extra hands-on exercises. I have access to an array of support resources from the Esri library of educational materials which I can provide in answer to the questions and discussions that come up during our classes.

I am planning to provide office hours, by appointment. It may work out that web-cast sharing over the internet will be an efficient way for me to help you with questions.

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| **Learning Objectives**  Students who apply themselves and complete the exercises and do most of the challenge material will establish a strong foundation in practical GIS for mapping and analytical problem solving. There is much more to learn than a single course can reasonably cover.  After completing the class students should be able to:   * Connect and organize data resources into geodatabases using ArcCatalog * Make maps from spatial data using ArcMap * Visualize, render, and query spatial data in a variety of ways * Generate PDF maps with standard layout components * Integrate data from spreadsheets and other sources into a database and map * Edit spatial data to improve quality, currency, add/delete features, and update attributes * Create tabular reports from spatial data and analysis results * Configure a smartphone device and use it for field data collection * Perform analysis on spatial data to identify and document spatial and statistical patterns * Access ArcGIS Online and publish maps and layers, find data, and create online maps * Create and share a story map showing results of research, observations, and analysis. |

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| **Materials**  This class will use ArcMap Version 10.2.2. A license to this Esri software product will be provided by Evergreen which will last for one year. Students are encouraged to install the ArcGIS software on their own personal computers for their home-use.  ArcGIS Online is a cloud system - accessible from the internet anywhere. User accounts to AGOL will be created at the start of the quarter for each student’s sharing of webmaps and related data.  Evergreen’s “Canvas” system will be used for collaboration, provision of supplemental materials, and evaluation. A discussion forum will be enabled through Canvas and monitored by the teacher.  The textbook is “Introducing Geographic Information Systems” by Michael Kennedy. This text is reportedly for sale at the Evergreen Book Store. Other readings will be provided through the Canvas system in PDF format.  Data will be provided through a variety of means, including ArcGIS formats, ArcGIS Online, and pointers or suggestions to students to search, find, and deploy data from a variety of public domain sources on the internet. |