Introduction to GIS

Fall 2020 - Masters of Environmental Studies/Masters of Public Administration

Syllabus Pre-Class Version (created Sep 23, 2020) – Subject to Change

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Class Meeting Times: Wednesdays 7 pm to 9:30 pm. Option to stay to 10 pm. Week 10 will be from 6-10 pm for students to give final project presentations all evening.

Optional Class Meeting: In recognition of the MPA schedule of core classes, the Introduction to GIS will be offered in a duplicate session on Mondays from 4 to 6 pm (on Zoom).

Optional GIS Lab Hours: One open lab session of two hours duration will be offered on Tuesdays from 4 to 6 pm on Zoom.

Location: Online (Zoom) Sessions – will be provided for each module

Credits: 4 - Graduate

Textbook: There is no textbook for this course, readings will be assigned for some modules

Covid19 Note: Teaching and Learning Approach Has Been Updated for Online Only. The good news is that Introduction to GIS relies almost entirely on cloud computing technology which is readily available and already widely used at Evergreen. The Intro to GIS course focuses on the sub-discipline of Web-GIS. Students need only an internet connection with good bandwidth and a modern web browser to access the software.

The Introduction to GIS course has been substantially revised to accommodate the requirements of the State of Washington and the administration of The Evergreen State College to provide all course material and meetings through online-only methods. There will be no class meetings in person. Instead, classes will meet on Zoom (or other online collaboration method). The duration of class meetings will be reduced to nominally 2.5 hours. The remaining learning will be through assigned GIS Lab exercises, supported by at least 2 hours per week of optional Open Zoom lab time.

GIS Lab exercises will challenge students to create maps and apps, perform spatial analysis, manage spatial data, and document workflows. Students will gain skills by fulfilling the lab requirements, building each week upon the learning of the previous weeks. Lab assignments are expected to require from 2 to 4 hours to complete each week. During each week, Open Zoom hours will be scheduled for the purpose of providing technical support, answering student questions, discussing final project ideas and generally supporting the student learning process.

Students will create a final project map and “story mapping” app, to demonstrate the culmination of their mapping skills learned throughout the course.
Eligibility and Pre-Requisites

*Introduction to GIS* is open to TESC graduate students, subject to availability. There is no formal prerequisite. Students should have familiarity with the Windows operating system and Excel spreadsheet skills. An optional “Excel basics” pre-class learning exercise will be available to help students who are new to Excel.

Program Description

You Will Make Many Maps!

*Introduction to GIS* will present a methodical review of the capabilities of Esri software for Geographic Information Systems (GIS). Students will use ArcGIS Online, Community Analyst, and Insights for ArcGIS, and potentially other ArcGIS software components - to conduct practical hands-on exercises in a guided week-by-week sequence.

While learning practical GIS skills and software tools, the class will present background lectures and theory readings to provide context for the acquisition of software skills. This class is designed to provide pre-requisite skills for students intending to proceed with Advanced GIS, typically offered during Fall quarter.

*Introduction to GIS* is the first of a sequence which results in a GIS Certification from the MES program for students who successfully complete all three GIS courses.

Course Pacing

*Introduction to GIS* for graduate students is a fast-paced class. In addition to the assigned weekly textbook exercise, Faculty will assign challenge exercises as “labs” that are intended to stimulate creative thinking about places and people, landscapes and oceans, human and built places, and managed lands and parks, and more. Most of the assigned labs require students to use “real life” datasets, as commonly found in the public domain.

Class time will be varied with combinations of discussion, lecture, student seminar, and focused in-class work sessions. Lab sessions will be offered during the week between formal class meetings. Lab sessions are optional but advised, to help students work through the lab assignments.

Students should plan to complete about 4 hours of homework, outside of class, each week.

Why the heavy load? The assumption is that most of the graduate students taking this course are interested in becoming practitioners of GIS at some professional level. The Intro to GIS class is not generally sufficient to become a professional practitioner. But the Intro to GIS class does provide a strong foundation for future study in *Advanced GIS* and *Special Topics in Advanced GIS* courses in subsequent quarters.

The skills are cumulative from week-to-week. Students that miss a class meeting or two may find themselves struggling to catch-up. This can lead to a no-credit or incomplete status at the end of the
quarter. If you know you need to miss a class or two, this might not be the right quarter to take this course.

**Final Project and Presentations at Week 10**

Students will be assigned a project to encourage independent thinking about GIS during the second half of the quarter. This project involves analysis of climate change variables and will be explained in more detail during the class meeting of Module 3 and 4. Students are invited to work in pairs to fulfill the project requirement, and make a joint presentation to their fellow students on the class meeting of Week 10. A final presentation is a mandatory requirement for students to get full credit for this course.

**Available Computing Resources and Software Licensing**

During the Covid-19 remote learning season, students will have to rely on their own computers to perform the GIS lab exercises. The course relies on the cloud technology of *Web-GIS* for almost all lab assignments. This means that students can use a wide variety of home computers, including both Windows and Apple operating systems, with widely varying capacities. The access to the cloud computing web-GIS is through a strand modern browser (such as Chrome, Firefox, or Edge).

Students who lack sufficient computing capability, can be granted the permission to access a computer on the Evergreen computing system through the “CAL” (Computer Applications Lab). This allows students to login remotely to the CAL system and take advantage of the college’s software, network access, and storage nodes. A computer at home is still necessary to enable the remote login, and most students performing GIS labs will benefit from acquisition of a second monitor. Remote Desktop Protocol (RDP) grants will be provided as needed, on Week 1.

**Canvas**

Class content is managed through Evergreen’s implementation of the Canvas online system, for distributing class modules and required data and reading files, uploading assignment results, taking quizzes, participating in discussion boards, and performing evaluations.

**Discussion and Questions and Office Hours**

Students are encouraged to work collaboratively. Please ask questions through the Canvas Discussion threads. Faculty will monitor the Discussion threads and provide answers and guidance. Experience shows that if one student has a question or problem, so do other students. Please do not email the faculty with “how do I” questions of technique or workflow related to exercises or software problems. Start with the Discussion board in Canvas. Other students may resolve your questions more quickly and faculty will make sure that answers and methods are resolved correctly in each Discussion thread.

Office hours (using Zoom) will be offered in the CAL starting with Week 2. The precise timing of office hours will be announced, depending on the needs of students and faculty and whether a TA is available to support the course.
**Awarding of Credit**

Full class credit will be awarded based on attendance, punctuality, in-class participation, and completion of all assigned exercises and presentation of the final map project.

Each assigned “lab” exercise concludes with a specific “quiz” or “assignment” through the Canvas system. The Canvas quizzes are arranged to ask a few questions of students for each exercise and require uploading a document that shows completion of each assignment.

Partial credit will not be awarded, except with the approval of the director of the MES program.

**Evaluations**

Students are required write a self-evaluation and a class/faculty evaluation. Evaluation documents will be submitted electronically and privately through the Canvas system, based on individual student login credentials.

Faculty will write a one-page evaluation of each student’s performance, based on criteria established at the start of the class (see below). According to Evergreen practice, student self and faculty evals are not exposed to the professor until after credits are posted.

An evaluation interview between student and faculty is also required – it should take about 20 minutes. Evaluation interviews will be offered in person or by skype/telephone.

**Students with Disabilities:**

If you are a student who experiences a disability and need auxiliary aids, academic adjustments, or other accommodations to support your access and participation in this program, please contact Access Services, LIB 2153, 360.867.6348. This course has been taken successfully by students who experience significant visual and auditory limitations -- and faculty is learning from these past students to embrace the challenge ... and observe some inspiring results!

Additional information is available at: [www.evergreen.edu/access](http://www.evergreen.edu/access).

**An Inspirational Quote**

"You will learn concrete things, facts, ideas, relationships. You will learn how to work with groups of people, which is how most of your work in life will be done, adjusting to new groups, helping each solve the problem it has tackled. You will, if we have done all our work well, learn how to learn: how to get data, how to deal with it, having gained confidence in your ability to handle situations where you either learn or remain helpless."

— Charles McCann, Evergreen’s First President, 1968-1977

**Course Topics Layout-By-Week – See Separate Document**

Please see accompanying document with the weekly class layout of activities and assignments.
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Syllabus Pre-Class Version (created Sep 21, 2020)

The Course Syllabus - explaining class meeting times and general class information - is provided in a separate document.

This document is the planned week-by-week layout of class meetings, topics, and assignments. This may be updated from time to time to accommodate schedule variations and student/faculty needs.

Introduction to GIS Weekly Class Layout

Pre-Class
Fill in the Personal Interest questionnaire (See in Canvas: “Module 0”)
Pre-Read: PDF on “ArcGIS Products and Extensions”
Discussions:
  - Read and participate in the Maps in the News Discussion on Canvas
  - Prepare to discuss one Maps in the News article during the first class (Week 1).

Module 1 - Introduction to GIS
Lecture: Introduction to GIS and the ArcGIS Platform
Discussion: Maps in the News
Practicum: Connect to ArcGIS Online and ArcGIS Pro
Lab: Create a Basic Web-Map, Load CSV Data, Publish a Web App
Assignment: Upload Screenshot of Hawaii Volcanoes Web Map and Basic Viewer App

Module 2 – Web-GIS and Excel
Lecture: Collaboration in the ArcGIS Platform, Sharing, Security Principles
Demonstration: Important Excel Skills for Data Management
Practicum: Installation of Esri Maps for Office (or Connection to CAL through Remote Login)
Lab: Charting in Excel – Salary Variations by Region and State in the USA
Assignment: Upload Scatterplots and “WageArts” Charts from Excel Analysis
Module 3 – Intro to Coordinate Systems
Lecture: Geographic Coordinate Systems (GCS)
Practicum: Compute Decimal Degrees from Sexagesimal Coordinate Conversion
Demonstration: Distortion in Map Projections (ArcGIS Pro)
Lab Assignment: Create an Analytical Web Map and Two Apps
Assignment: Upload Washington Housing Basic Viewer and Minimalist Template Apps
Reading: Esri Coordinate System Articles

Module 4 – Data Management and Mapping in Esri Maps for Office
Lecture: The Good, the Bad, and the Ugly – Formats for Spatial Data
Demonstration: Adding Items to Web Content and Web Maps
Practicum: Creating a Feature Class from Shapefile and CSV
Lab: Create Maps, Queries, and Share Data from an Excel Table
Assignment: Upload Bohol Island maps, Share-as URL in ArcGIS Online App

Module 5 – Census Data Resources and Uses
Lecture: TIGER Data Properties and FIPS Coding
Demonstration: Introduction to the Esri Living Atlas
Practicum: Accessing US Census Data Resources and Data Enrichment
Lab: Spatial Analysis by Aggregation to Polygons and the Web App Builder
Assignment: Upload Screenshot and URL for Washington LUST Map Journal App

Module 6 – Joining Tables for Spatial Analysis
Lecture: Principles of Joining
Demonstration: Introduction to Arcade for Field Calculations
Practicum: Joins Gone Bad – Fixing Data Type Mismatches
Lab: Mapping the WA Legislature
Assignment: Upload Screenshot and URL for WA Party Map and Comparison App
Reading: Background on Yale Climate Change Opinion Project and Resources

Module 7 – Time in the GIS, and Advanced Web Cartography
Lecture: Spatial Temporal GIS
Practicum: Create Layers, Manage Folders
Lab: Temporal Data in Hexabins
Assignment: Upload Screenshot and Time Aware App for International Piracy Map
Writing Assignment: Final Project Concept Note
Module 8 – Table Analysis in Esri *Insights*

Lecture: Methods for Basic Spatial Analysis - Buffer, Dissolve, Summarize
Practicum: Selection Sets in WAB
Demonstration: Creating a Simple Field Data Survey
Lab: Analyze a Table using Insights, Capture the Workflow
Assignment: Upload Return-on-Investment Graphics, Results of Analysis, and “Cards”

Module 9 – Introduction to Field Data Collection

Lecture: Esri Platform Interactions
Practicum: Creating a Simple Field Data Survey
In-Class: Open Work Session on Final Projects
No Assignment: Work on Final Project
Extra office hours will be provided during this week to support student project needs

Week 10 – Student Presentations

Students will present their Final project Story Maps.
Scheduled Student Assessment Conferences Posted to Canvas Calendar

Evaluations

Sign up for Posted Time Slots in Calendar