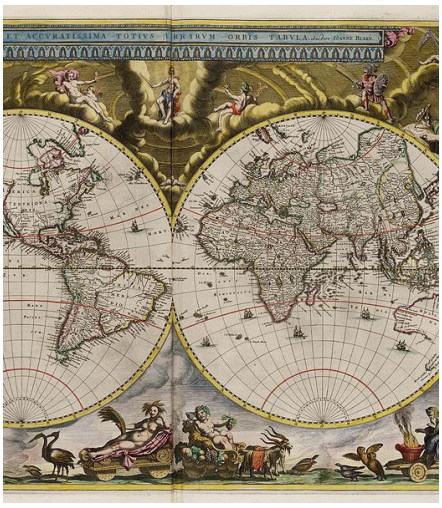
Course Number 69303-003 – Fall 2024

Geographic Information Systems Certificate Program



Instructors

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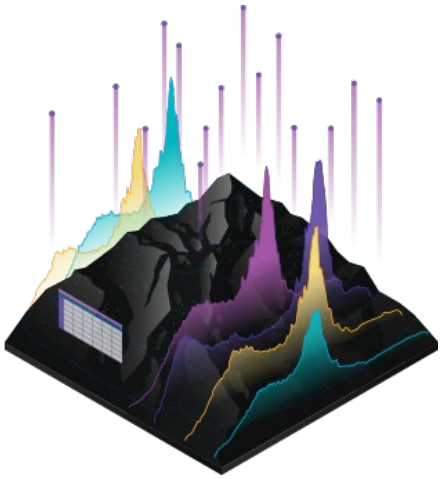
Description

The Geographic Information Systems (GIS) Certificate Program provides students with an overview of the world of geospatial technology and how it is used to solve real world problems. The course offers understanding of the geospatial concepts and hands-on experience using the latest tools in the GIS industry, using ESRI's ArcGIS software.

Objectives

- Learn cartographic principles for map design, map reading and interpretation
- Learn concepts such as map scale, coordinate systems, and map projections
- Learn about data models and data formats
- Create and edit data; symbology
- Identify and access publicly available data sets
- Data visualization techniques and analysis tools
- Automate GIS custom workflows with Model Builder
- ArcGIS extensions such as Spatial Analyst, 3D analyst, Network Analyst
- Introduction to Python
- Introduction to Web GIS (ArcGIS Online, Story Map, Dashboard)



Source: ESRI

Class Hours

Tuesdays & Thursdays

6:00 pm – 8:00 pm

Online: Zoom Meeting

https://unm.zoom.us/j/99204585888

Required Materials

Getting to Know ArcGIS Pro 3.2 ISBN 9781589487772

Optional Materials

How to Lie with Maps 3rd Edition, ISBN 978-0226435923

Required Software

PC or a Laptop with Windows OS is required

ArcGIS Pro (*license provided by the UNM Continuing Education*)

Course Schedule

Week 1	
Aug 27	Course Administration, Syllabus, Introductions, Software Provisioning Introduction to GIS, A Brief History
Aug 29	Data Models and Data Formats Reading – Chapter 1 & Chapter 2 Exercises: 2a, 2b (Getting to Know ArcGIS Pro)
Week 2	
Sep 3	What is Cartography? & Brief History Map Elements & Map Design Reading – Chapters 2, 10 (How to Lie with Maps) Exercise 1: Make a Map (Instructions provided in class)*
Sep 5	Coordinate Systems and Map Projections Map Scale & Generalization Reading – Chapter 3 (How to Lie with Maps) Exercise 2: Map Projections (Instructions provided in class)
Week 3	
Sep 10	Thematic Maps Readings – Chapters 6, 7 (How to Lie with Maps) Exercise 3: Thematic Maps (Instructions provided in class)*
Sep 12	Color & Typography Reading – Chapter 5 (How to Lie with Maps)
Week 4	
Sep 17	Data Classification Readings – Chapter 11 (How to Lie with Maps) Exercise 3b (Getting to know ArcGIS Pro) Exercise 4: Data Classification (Instructions provided in class)*
Sep 19	Ethics in GIS
Week 5	
Sep 24	Geodatabases Exercise 4a (Getting to know ArcGIS Pro)

Sep 26	Creating and Editing Data Exercises 4b, 4c (Getting to know ArcGIS Pro)
Week 6	
Oct 1	Querying Data Exercise 3a (Getting to know ArcGIS Pro)
Oct 3	Quiz and Review
Week 7	
Oct 8	Joins and Relates Exercise 3d (Getting to know ArcGIS Pro)
Oct 10	Geocoding Exercise 7b (Getting to know ArcGIS Pro)
Week 8	
Oct 15	Vector Analysis: Preparing data for analysis, Data Extraction Exercise 7c (Getting to know ArcGIS Pro)
Oct 17	Vector Analysis: Proximity and Overlay operations Exercises: 8a, 8b (Getting to Know ArcGIS)
Week 9	
Oct 22	Geodatabase Topology
Oct 24	Introduction to Model Builder Exercises 5a, 5b (Getting to know ArcGIS Pro)
Week 10	
Oct 29	Working with Rasters, Georeferencing
Nov 5	Quiz & Review
Week 11	
Nov 7	TBA
Nov 12	TBA
Week 12	
Nov 14	Raster Analysis 1 – Conditional, Density, Distance, Extraction Exercises • Part A: Introduction to the ArcGIS raster • Part B: Extract data by mask
Nov 19	Raster Analysis 2 – Map Algebra, Reclassify, Raster Overlay, Raster Statistics

Week 13	
Nov 21	Raster Analysis 3 – Interpolation, Surface, Generalization Exercises • Part A: ArcGIS Geostatistical Analyst • Part B: Site Selection
Nov 26	Terrain Analysis Exercises • Part A: Creating a 3D Scene, creating a TIN from contours, draping features onto a TIN, and navigating Scenes • Part B: 3D Analyst for landform analysis
Week 14	
Dec 3	Python Scripting Part 1 Exercises – Python Window and Scripting
Dec 5	Python Scripting Part 2 Exercises – Python Window and Scripting
Week 15	
Dec 10	Network Analysis Exercises – Network Analysis
Dec 12	Web GIS – Intro to ArcGIS Online Exercises • Part A: Add data to ArcGIS Online and Create a Web map; customizing and stylizing data on ArcGIS Online • Part B: Create a Web mapping application

Quick Reference Table of Assignments

Exercise	Due Date
Exercise 1 – Making a Map*	September 13, 2024
Exercise 3 – Thematic Maps*	September 20, 2024
Exercise 4 – Data Classification*	September 27, 2024
Project – TBD	Tentative

* Required to turn in the assignment.

References:

Spatial Analyst: https://pro.arcgis.com/en/pro-app/latest/help/analysis/spatial-analyst/basics/what-is-the-spatial-analyst-extension.htm

3D Analyst: https://pro.arcgis.com/en/pro-app/latest/help/analysis/3d-analyst/get-started-with-3d-analyst-in-pro.htm

Network Analyst: https://pro.arcgis.com/en/pro-app/latest/help/analysis/networks/what-is-network-analyst-.htm

Additional Requirements

Students are expected to complete and turn in all assignments on time and participate in quizzes to receive the certificate.

Attendance and active participation in all classes is expected. Please inform the instructor ahead of time if you anticipate absence from classes.

Must have a working microphone and web camera. Web cameras must be ON throughout the class. Mute microphone unless to identify yourself and/or share thoughts, to avoid distracting background noise.