Higher Ed Guide to Esri E-Learning for Modern GIS

Overview

This guide is for educators who want to use authoritative Esri web-based learning resources as part of college or university courses. Listed items are available as of July 6, 2023 and are expected to be available through at least September 30, 2023. New listings are in orange.

All resources are web courses unless otherwise noted. Full descriptions can be found at the links provided. The complete Esri catalog can be found at esri.com/training/catalog. The information provided in this guide is subject to change without notice. Please email GIStraining@esri.com or call (800) 447-9778, ext. 5757 with questions about courses.

You and your students may be eligible for unlimited access to the entire collection of self-paced e-Learning (web courses, training seminars, and more) if your institution has a qualifying product with a current maintenance subscription. To determine if this applies to you, contact your Esri software license administrator, check online, or email educationinfo@esri.com.

A learning plan is a set of learning content with a suggested order. You can create your own plan or copy and edit one you find. You can assign your plan to students or colleagues and track their progress. See the site Help (Category: Learning Plans) for more information.

ArcGIS Online foundation

The following resources offerings help students new to GIS learn foundational concepts and begin building skills using ArcGIS Online.

Getting started

- Getting Information from a GIS Map (1 hr., 45 mins.) Explains that GIS links geometric map features with tables of numbers and facts to reveal the hidden meaning in data.
- ArcGIS Online Basics (1 hr., 50 mins.) Presents basic ArcGIS Online terms and capabilities.

Mapping and visualization

- Smart Mapping: Get Started (Story Map) Explains how to create effective, impactful maps quickly.
- Smart Mapping Styles in the New Map Viewer (Story Map) Collection of stories shows how to use the various map styles quickly and with confidence.
- Building an App in ArcGIS Online to Expand Food Access (ArcGIS lab, 3 hrs., 45 mins.) Style and customize a web map using ArcGIS Online that shows farmers market locations in relation to food stores as well as the poverty status and racial and ethnic composition of the community.
- Creating an Underground Scene in ArcGIS Online (ArcGIS lab, 1 hr., 40 mins.) Builds navigation and 3D visualization skills using Scene Viewer to explore a 2011 earthquake in New Zealand.

Data management

- Location-Enabling Data (1 hr., 15 mins.) Introduces the concept of geocoding. Describes three ways to find locations on a map: x, y coordinates, addresses, and place names.
- Displaying Coordinate Data on a Map (35 mins.) Shows how to transform coordinates into locations on a map.

- [Creating and Sharing GIS Content Using ArcGIS Online](#) (2 hrs., 20 mins.) Covers publishing data and layers to ArcGIS Online as services for web map and web app creation.

Related Learning Plans
- **[Make and Share Web Maps with ArcGIS Online](#)**
- **[Fundamentals of Mapping and Visualization](#)**

ArcGIS Pro foundation

The following resources introduce GIS and ArcGIS Pro to new users. Courses with workflows that combine ArcGIS Pro and ArcGIS Online are included in this section.

The free *[ArcGIS Pro Terminology Guide](#)* is recommended for all students of ArcGIS Pro.

Getting started
- [GIS Basics](#) (2 hrs., 35 mins.) Presents fundamental components and capabilities of GIS and how ArcGIS can help organizations address business needs. Uses ArcGIS Pro and ArcGIS Online.
- [ArcGIS Pro Basics](#) (50 mins.) Introduces the capabilities of ArcGIS Pro.

Mapping and cartography
- [Getting Started with Mapping and Visualization](#) (1 hr., 15 mins.) Explores the 2D and 3D information products that you can create with ArcGIS Pro.
- [Symbolizing Map Layers](#) (1 hr., 45 mins.) Teaches basic principles of map symbology.
- [Querying Data Using ArcGIS Pro](#) (30 mins.) Teaches the building blocks of query expression and how to select features that meet one or more attribute criteria.
- [Mapping Racial Disparities in Breast Cancer Mortality Rates Using ArcGIS Pro](#) (ArcGIS lab, 2 hrs., 40 mins.) Use GIS maps and tabular data to visualize, calculate, and analyze statistical data.
- [How Maps Work and How to Make Them Work](#) (Video, 49 mins.) Covers basic principles of cartographic design, communicating with maps, and the map-making process.
- [Labeling Map Features](#) (1 hr., 35 mins.) Teaches how to add and customize labels, as well as label placement concepts.
- [Creating a Map Layout](#) (1 hr., 15 mins.) Presents map layout guidelines for static and web map design and shows how to apply various map layout elements.
- [ArcGIS Pro: Three Visualization Effects in Five Minutes](#) (Video, 5 mins.) In-depth explanation of using transparency, layer, and feature blending to create stunning visual map effects.
- **[Cartography.](#) (MOOC; 6 weeks; April 3 – May 15, 2024)** Experienced cartographers teach their craft, including cartographic design, messaging, and ArcGIS skills.
- [Creating a Web Map in ArcGIS Pro](#) (3 hrs., 5 mins.) Teaches how to create a dynamic, multiscale map using ArcGIS Pro and then publish it to ArcGIS Online.
- [Creating a Map Series in ArcGIS Pro](#) (2 hours) Covers creating two types of multi-page map series: spatial map series and bookmark map series.
- [Creating and Sharing Animation in ArcGIS Pro](#) (1 hr., 30 mins.) Shows how to animate and produce ready-to share videos of your work.

Data management
- [Introduction to Spatial Data](#) (1 hr., 30 mins.) Presents vector and raster spatial data models.
- [Getting Started with Data Management](#) (1 hr., 25 mins.) Explores how GIS data is structured, stored, and accessed.
- [Location-Enabling Data](#) (1 hr., 15 mins.) Introduces the concept of geocoding. Describes three ways to find locations on a map: x, y coordinates, addresses, and place names.
- [Displaying Coordinate Data on a Map](#) (35 mins.) Shows how to transform coordinates into locations on a map.

- Mapping Addresses and Places (2 hrs.) Shows how to transform addresses to locations on a map, and then answer spatial questions.
- Introduction to Coordinate Systems (2 hrs. 25 mins.) Teaches why coordinate systems are important. Covers geographic and projected coordinate systems.
- Acquire Data for a GIS Project (3 hrs., 5 mins.) Teaches how to evaluate a whether a given data set matches your data needs. Gives sources of data and maps for starting a GIS project.
- Getting Started with the Geodatabase (3 hrs., 30 mins.) Introduces geodatabase components and presents techniques for organizing vector and raster data in a geodatabase.
- Integrating Data in ArcGIS Pro (1 hr., 15 mins.) Teaches GIS data concepts and how to add data to a geodatabase.
- Introduction to Data Engineering (2 hrs., 30 mins.) Explains ArcGIS Pro tools and techniques for exploring data quality and preparing data for use in analysis.
- Exploring and Importing Metadata in ArcGIS Pro (Video, 5 mins.) Demonstrates downloading some data, then creating a feature class and adding and editing metadata.
- Editing Basics in ArcGIS Pro (2 hrs.) Shows how to create and modify features and attributes.
- How to COGO a Traverse with ArcGIS Pro (Video, 8 mins.) Uses the Traverse tool to create line and polygon boundaries from surveyed bearings and distances.
- Creating 3D Features Using Editing Workflows (2 hrs., 10 mins.) Teaches how to create 3D features using editing tools and manage 3D data for visualization and analysis.

Related Learning Plans
- **GIS Fundamentals**
- **ArcGIS Fundamentals**
- **ArcGIS Pro Fundamentals**
- **Fundamentals of Mapping and Visualization**
- **Data Editing Essentials**
- **Fundamentals of Data Management**
- **Location-Enabling Your Data**
- **3D Content Essentials**

Spatial Analysis
The following resources introduce ArcGIS analysis concepts and techniques. Courses that can be completed with ArcGIS Online are so noted; otherwise, ArcGIS Pro is required. (Some workflows use ArcGIS Pro *and* ArcGIS Online.)

Getting started
- Getting Started with Spatial Analysis (1 hr., 10 mins.) Introduces the six categories of spatial analysis that can help you answer geographic questions. (Can be completed with ArcGIS Online or ArcGIS Pro)
- Getting Started with Geoprocessing (1 hr., 30 mins.) Presents key concepts and geoprocessing techniques used for analysis, including setting the geoprocessing environment.
- Calculating Disparities in Pollution Exposure Using ArcGIS (ArcGIS lab, 3 hrs., 20 mins.) Map and analyze toxic exposure risk to population subgroups. Create a dashboard to share results.
- **Going Places with Spatial Analysis (MOOC; 6 weeks; January 24 – March 6, 2024)** Explores why location matters in a wide range of business and policy decisions and offers hands-on experience with authentic spatial analysis workflows.
- **GIS for Climate Action (MOOC; 6 weeks; October 25 – December 6, 2024)** Discover how GIS is being used to understand and prepare for a future that requires more resilient communities, systems, and infrastructure. Use ArcGIS to explore climate change indicators, risks, impacts, and dashboards.

Spatial relationships and pattern detection

- [Understanding Spatial Relationships](#) (50 mins.) Introduces basic methods for describing and analyzing relationships between features.
- [Summarizing Data by Spatial Relationships](#) (55 mins.) Teaches about various summarization methods and using them to answer spatial questions.
- [Working with Charts and Reports in ArcGIS Pro](#) (ArcGIS lab, 4 hrs.) Prepare data from a deep-sea coral database for analysis, answer questions about the data, and create a report that conveys some of the findings.
- [Introduction to Proximity Analysis](#) (50 mins.) Teaches proximity analysis uses and methods.
- [Introduction to Overlay Analysis](#) (1 hr., 15 mins.) Teaches overlay analysis methods. Shows how to use vector overlays to apportion and assign variables from one feature to another.
- [Mapping Clusters: Introduction to Statistical Cluster Analysis](#) (50 mins.) Covers skills and concepts to begin cluster analysis. Uses Hot Spot and Cluster and Outlier analysis tools.
- [Suitability Modeling: Introduction](#) (2 hrs., 40 mins.) Teaches how to define a problem in terms of an analysis goal and suitability criteria, plus how to prepare data for a suitability model.
- [Introduction to Space-Time Analysis](#) (25 mins.) Describes space-time analysis and its capabilities.
- [Terrain Analysis Using ArcGIS Pro](#) (2 hrs., 45 mins.) Uses ArcGIS Spatial Analyst tools to derive new raster data from an elevation raster for various applications.

Predictive analytics

- [Interpolating Points Using ArcGIS Online](#) (1 hr., 5 mins.) Explains how to use measured values at known sample locations to predict values at new locations.
- [Introduction to Regression Analysis Using ArcGIS Pro](#) (3 hrs.) Introduces regression analysis concepts and teaches how to create a properly specified regression model.
- [Geostatistical Interpolation: Introduction](#) (1 hr., 40 mins.) Explains key geostatistical interpolation concepts. Shows how to use ArcGIS Pro to evaluate associated data assumptions.
- [Calculating Density Using ArcGIS](#) (1 hr., 30 mins.) Teaches how to create density surfaces to reveal concentrations of point or line features. Uses a business scenario.
- **[Spatial Data Science: The New Frontier in Analytics](#) (MOOC; 6 weeks; August 30 – October 11, 2023)** Explores the application of spatial data science to uncover hidden patterns and improve predictive modeling. Uses ArcGIS Pro, ArcGIS Notebooks, and more.

3D visualization and analytics

- [ArcGIS Pro: An Overview of 3D Analysis](#) (Video, 44 mins.) Describes the wide range of 3D analysis techniques available in ArcGIS Pro.
- [Introduction to 3D Data](#) (2 hrs.) Covers the types of data used to model the real world using 3D scenes, including functional surfaces and 3D feature types.
- [Authoring 3D Scenes](#) (2 hrs.) Teaches how to plan a 3D scene, the types of data that can be used in a scene, and how to create a scene. Uses ArcGIS Pro and ArcGIS Online.

Tools and techniques

- [Automating Workflows Using ArcGIS Pro Tasks](#) (4 hrs.) Teaches how to create and share ArcGIS Pro tasks to increase productivity.
- [Building Geoprocessing Models Using ArcGIS Pro](#) (2 hrs., 30 mins.) Introduces the steps to create, validate, and run geoprocessing models that automate ArcGIS analysis workflows.

Additional spatial analysis courses can be found in the following learning plans and in the *[Higher Ed Guide to Esri E-Learning for Spatial Data Science](#)*.

Related Learning Plans
- **Exploring Spatial Relationships**
- **Spatial Analysis and Data Science Fundamentals**
- **Identifying Clusters Using ArcGIS**
- **Interpolating Surfaces Using ArcGIS**
- **Regression Analysis Essentials**
- **Finding the Best Place** (suitability analysis)
- **Finding the Best Paths** (network analysis)
- **Distance Analysis Essentials**
- **3D Visualization Essentials**
- **3D Analysis Essentials**
- **Get Started with Visibility Analysis**

ArcGIS Insights
The following resources introduce visualizing and analyzing data using ArcGIS Insights.

- Mapping Racial Disparities in Breast Cancer Mortality Rates Using ArcGIS Insights Online (ArcGIS lab, 3 hrs., 10 mins.) Use GIS maps and tabular data to visualize, calculate, and analyze statistical data.
- Performing Sales Data Analysis with ArcGIS Insights Online (ArcGIS lab, 2 hrs., 35 mins.) Build a workbook with a map, charts, indicator values, filters, and a table. Use the workbook to examine the data. Share results as an interactive visualization tool and model.
- Using Design Principles to Enhance the Visual Appearance of an ArcGIS Insights Workbook (ArcGIS lab, 55 mins.) Apply cartographic principles and design choices to an existing Insights workbook. Create a professional-looking report using page and card settings and creating a custom theme.

Related Learning Plan
- **ArcGIS Insights Fundamentals**

Storytelling
The following resources introduce creating and sharing stories using ArcGIS StoryMaps.

- Telling Stories with GIS Maps (1 hr., 25 mins.) Teaches how traditional elements of story can incorporate GIS maps to create an interactive story on the web.
- Discover the Possibilities with ArcGIS StoryMaps (StoryMap) Collects all the instructional content produced by Esri's StoryMaps team, including new user guides and in-depth tutorials.
- ArcGIS StoryMaps: An Introduction (Video, 28 mins.) Presents a step-by-step guide to using the StoryMaps builder and bringing content to life. Discusses new and planned features.

Related Learning Plan
- **ArcGIS StoryMaps Fundamentals**

Dashboards
- [Using Arcade Expressions in ArcGIS Dashboards](#) (1 hr., 45 mins.) Explains how to use Arcade expressions to create visualizations and access derived data sources to improve a dashboard.

Related Learning Plan
- **[ArcGIS Dashboards Fundamentals](#)**

Field data capture
The following resources introduce applications used to plan and execute field data capture using survey-centric or map-centric mobile apps.

ArcGIS Survey123
- [ArcGIS Survey123 Basics](#) (1 hr., 15 mins.) Introduces the ArcGIS Survey123 components and workflow. Explains how to create surveys, get answers, and view results.
- [ArcGIS Survey123: Creating and Publishing Surveys](#) (1 hr., 20 mins.) Teaches how to create, publish, and share survey forms through the Survey123 website.
- [ArcGIS Survey123: Using ArcGIS Survey123 Connect](#) (2 hrs., 20 mins.) Teaches how to create highly customized surveys with XLSForms to improve the quality and usefulness of your surveys.

ArcGIS QuickCapture
- [Collecting and Visualizing Data with ArcGIS QuickCapture](#) (ArcGIS lab, 2 hrs., 30 mins.) Design an app to collect data on people's emotional reactions to places and infrastructure in a city.

ArcGIS Field Maps
- **[Get Started with Field Maps Designer](#) (Live Training Seminar, 1 hour, August 17, 2023)** See capabilities and best practices to create forms that mobile workers can use to quickly and easily capture accurate data. Shows complete workflow form map preparation to data collection.

Related Learning Plan
- **[Create Smart Surveys and Forms Using ArcGIS Survey123](#)**

Scripting and development
The following resources cover scripting techniques that can be used with ArcGIS, such as Arcade and Python, and development tools, such as app builders and ArcGIS Notebooks.

Arcade
- [Introduction to ArcGIS Arcade](#) (2 hrs., 25 mins.) Teaches common ArcGIS Online workflows using Arcade expressions: formatting labels, customizing pop-up windows, and visualizing features.
- [Using Arcade Expressions in ArcGIS Dashboards](#) (1 hr., 45 mins.) Explains how to use Arcade expressions to create visualizations and access derived data sources to improve a dashboard.

Apps and app builders
- [ArcGIS Instant Apps: An Introduction](#) (Video, 57 mins.) Describes how to create, design, and customize app, and how to choose the appropriate tools for a focused app experience.
- [ArcGIS AppStudio Basics](#) (1 hr., 45 mins.) Covers core concepts and terminology, as well as basic steps of app development with ArcGIS AppStudio.
- [Configuring Apps Using ArcGIS AppStudio](#) (2 hrs., 25 mins.) Teaches how to use ArcGIS AppStudio templates to create and deploy native apps on iOS, Android, and other platforms.

JavaScript
- [Basics of JavaScript Web Apps](#) (1 hr., 15 mins.) Explores how to make basic web apps using HTML, CSS, and JavaScript. Shows how to build an app using the ArcGIS API for JavaScript.

Python
- [Python for Everyone](#) (3 hrs., 30 mins.) Introduces basic Python concepts and the Python scripting environment in ArcGIS. (Course is available for ArcGIS Online or ArcGIS Pro.)
- [Introduction to ArcGIS API for Python](#) (35 mins.) Presents the organization of modules and objects that provide the spatial capabilities in ArcGIS API for Python.
- [Python Scripting: Modifying Layer Properties](#) (1 hr., 50 mins.) Focuses on writing code using arcpy.mp to reference layer properties for viewing or modification.
- [Python Scripting: Repairing Data Sources](#) (1 hr., 50 mins.) Shows how to use the ArcPy mapping module to automate the process of finding and repairing broken data sources in ArcGIS Pro.
- [Python Scripting: Modifying Page Layouts](#) (2 hrs., 20 mins.) Focuses on writing code using arcpy.mp to modify layout elements and export page layouts.
- [Python Scripting: Modifying Map Series](#) (2 hrs., 50 mins.) Teaches using an ArcGIS notebook and python code to update and export an existing map series, and to manage a map series PDF.
- [Performing Analysis Using ArcGIS API for Python](#) (1 hr., 25 mins.) Introduces the analysis capabilities available in the API and demonstrates the process to integrate them into apps.
- [Visualizing Data Using ArcGIS API for Python](#) (3 hrs. 10 mins.) Covers key visualization methods and customization options for creating maps and charts with the API.
- [Creating Python Scripts for Raster Analysis](#) (1 hr.) Discusses creating a raster object, accessing its properties, and using them in your Python scripting.

ArcGIS Notebooks
- [ArcGIS Notebooks Basics](#) (1 hr.) Introduces ArcGIS Notebooks interface and functionality for creating Python Notebooks that perform spatial data analysis tasks.
- [Data Science Workflows Using ArcGIS Notebooks](#) (2 hrs.) Introduces the process for performing data engineering tasks using ArcGIS Notebooks in ArcGIS Pro.

Related Learning Plans
- **[ArcGIS Arcade Fundamentals](#)**
- **[Building Web Solutions with ArcGIS Experience Builder](#)**
- **[ArcGIS API for JavaScript Fundamentals](#)**
- **[ArcGIS API for Python Fundamentals](#)**
- **[ArcPy Essentials](#)**
- **[ArcGIS Notebooks Fundamentals](#)**

Imagery and Remote Sensing
The following resources cover key skills for working with imagery and rasters in ArcGIS. More courses are listed in the *[Higher Ed Guide to Esri E-Learning for Imagery and Remote Sensing](#)*.

- [Getting Started with Imagery and Remote Sensing](#) (3 hrs., 20 mins.) Provides a high-level overview of remote sensing and imagery concepts. Explores a wide range of imagery applications to prepare students for imagery analysis.
- [Displaying Raster Data in ArcGIS](#) (3 hrs., 15 mins.) Covers techniques for displaying, symbolizing, and enhancing the appearance of rasters in ArcGIS Pro.
- [Introduction to Image Classification](#) (1 hr., 15 mins.) Introduces options for creating thematic classified rasters in ArcGIS.

- [Deep Learning Using ArcGIS Image for ArcGIS Online](#) (1 hr., 45 mins.) Teaches how to use pretrained deep learning models from ArcGIS Living Atlas to solve everyday problems.
- [Change Detection Using Imagery](#) (2 hrs., 30 mins.) Covers improving the appearance of imagery, NDVI and NBR analysis, and digitizing features to quantify areas of change.
- **[Imagery in Action](#)** (MOOC; 6 weeks; September 20 – November 1, 2023) Explores cutting-edge imagery applications and workflows using ArcGIS Pro, ArcGIS Online, and ArcGIS Image Analyst.
- [Managing Raster Data Using ArcGIS](#) (2 hrs.) Teaches how to organize raster data within a mosaic dataset in preparation for visualization and analysis.
- [Processing Raster Data Using ArcGIS Pro](#) (2 hrs.) Teaches how to process raster data and extract information products on-the-fly using raster functions and raster function chains in ArcGIS Pro.

Related Learning Plan
- **[Image Classification Using ArcGIS](#)**

Community engagement
The following resources present a modern ArcGIS approach to address a topic of interest.

- [Applying the Racial Equity Workflow Using ArcGIS](#) (3 hrs., 45 mins.) Presents a framework to analyze inequities and provide change while engaging the community. Uses ArcGIS Pro, ArcGIS Online, and ArcGIS Dashboards.
- [Measuring and Visualizing Digital Exclusion Using ArcGIS Pro](#) (ArcGIS lab, 1 hr., 5 mins.) Analyze internet access data in the U.S. and visualize exclusion patterns across race and ethnic groups.
- [Create a Web App to Share Digital Exclusion Data](#) (ArcGIS lab, 55 mins.) Build a web app to share data about internet access in the U.S. to help others understand digital exclusion.

Additional Instructional Materials

[Modern GIS](#) Curriculum is a collection of instructional materials produced by Esri that includes exercises based on real-world scenarios, overview slides, and pertinent articles and blogs. The purpose of the materials is to aid in the development of university-level curricula for learning how to understand and apply the most modern mapping tools and workflows to data. The curriculum covers the breadth of ArcGIS technology, as well as fundamental GIS concepts of location analytics, fieldwork, and collaboration.

Notes

- You can view lists of new training, training pending retirement, and retired training on the [New and Retired Training Options](#) page. You will receive a message when retirements are announced. (Click View Messages while signed into Esri Academy.)

- If you plan to assign a MOOC to a group of students or to an entire class, please review the following resources:
  - For students: [Get Ready for an Excellent MOOC Experience](#)
  - For instructors: [Assigning an Esri MOOC to Students](#)

- To request a transfer of training history from an institutional account to another account, students should contact Esri Customer Service at service@esri.com or (888) 377-4575.