

Higher Ed Guide to Esri E-Learning for Imagery and Remote Sensing



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 June 10, 2024, through Esri Academy. This guide is expected to be updated annually. The information provided in this guide is subject to change without notice. **New listings are shown in orange.**

All items listed are web courses unless otherwise noted. Full descriptions can be found at the links provided. The complete Esri Academy catalog can be found at esri.com/training/catalog. 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 Esri Academy [Help](#) page (Category: Learning Plans) for more information.

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TECHNOLOGY

ArcGIS foundation

The following resources cover foundational concepts and skills to give students a basic familiarity with ArcGIS Pro software. Some courses also use ArcGIS Online.

- The free [ArcGIS Pro Terminology Guide](#) is recommended for all students of ArcGIS Pro.
- [GIS Basics](#): Presents fundamental components and capabilities of GIS and how ArcGIS can help organizations address business needs. (2 hrs., 35 mins.)
- [ArcGIS Pro Basics](#): Introduces tools to integrate, visualize, analyze, and share data. (50 mins.)
- [Integrating Data in ArcGIS Pro](#): Teaches basic skills to add various types of data to a file geodatabase to support a planned project. (1 hr., 15 mins.)
- [ArcGIS Online Basics](#): Presents basic ArcGIS Online terms and capabilities. (1 hr., 50 mins.)

CAPABILITIES

Get started

- [Getting Started with Imagery and Remote Sensing](#): Provides a high-level overview of remote sensing and imagery concepts. Explores a wide range of imagery applications to prepare students for imagery analysis. (3 hrs., 20 mins.)

Managing imagery

- [Managing Raster Data Using ArcGIS](#): Teaches how to organize raster data within a mosaic dataset in preparation for visualization and analysis. (2 hrs.)
- [Working with NetCDF Data in ArcGIS Pro](#): Teaches how to use NetCDF-derived data to incorporate scientific data and models into common GIS workflows. (2 hrs.)

Visualization and exploitation

- [Displaying Raster Data in ArcGIS](#): Teaches techniques to display and symbolize rasters and imagery, modify raster properties, and apply appearance functions. (3 hrs., 15 mins.)
- [Visualizing Multidimensional Data Using Voxels in ArcGIS Pro](#): Explores the ecological range that corals live in with a voxel layer that displays Ecological Marine Unit data to visualize dimensions of water temperature and salinity. (ArcGIS lab, 2 hrs., 5 mins.)
- [Introduction to Voxel Layers](#): Teaches key concepts associated with multidimensional data as well as how to create and visualize voxel layers in ArcGIS Pro. (1 hr., 50 mins.)
- [Bring Your Imagery to Life with ArcGIS Reality](#): Explores uses of reality mapping data products across the ArcGIS system and the process to create popular imagery-derived products, including True Orthos and 3D meshes. (Training seminar, 1 hr.)

Analyzing imagery

Tools and techniques

- [Getting to Know ArcGIS Image Analyst](#): Presents essential workflows for getting started with the ArcGIS Image Analyst extension in ArcGIS Pro. (Document, 13 pages.)
- [Processing Raster Data Using ArcGIS Pro](#): Teaches efficient ways to process raster data and extract information products on-the-fly using raster functions in ArcGIS Pro. (2 hrs.)
- [ArcGIS Deep Learning Tools for Imagery](#): Explores the deep learning capabilities of ArcGIS. Shows a workflow to create a land-cover map using ArcGIS Notebooks. (Training seminar, 1 hr.)

- [Deep Learning Using ArcGIS Image for ArcGIS Online](#): Teaches how to use pretrained deep learning models from ArcGIS Living Atlas of the World to solve everyday problems. (1 hr., 45 mins.)
- [Deep Learning Using ArcGIS Pro](#): Explains how deep learning supports GIS analysis. Teaches how to use a pretrained deep learning models from ArcGIS Living Atlas of the World. (2 hrs., 15 mins.)
- [Automating Workflows Using ArcGIS Pro Tasks](#): Teaches how to create and share ArcGIS Pro tasks to increase productivity. (4 hrs.)
- [Building Geoprocessing Models Using ArcGIS Pro](#): Introduces the steps to create, validate, and run geoprocessing models that automate ArcGIS analysis workflows. (2 hrs., 30 mins.)
- [Analyze Imagery with Raster Functions Using ArcGIS Image for ArcGIS Online](#): Uses ArcGIS Image for ArcGIS Online to analyze imagery layers using raster functions. (ArcGIS lab, 40 mins.)
- [Measuring Land Cover Change Using ArcGIS Pro](#): Uses ArcGIS Pro to identify and measure change between two thematic datasets. (ArcGIS lab, 25 mins.)

Related Learning Plan

- [Imagery and Remote Sensing Fundamentals](#)
- [Deep Learning Using ArcGIS](#)

Image analysis applications

- [Change Detection Using Imagery](#): Explores improving the appearance of imagery, NDVI and NBR analysis, and digitizing features to quantify areas of change. (2 hrs., 30 mins.)
- [Performing Change Detection Using Raster Functions in ArcGIS Pro](#): Teaches how to detect changes in imagery using raster functions in ArcGIS Pro. Uses raster functions to perform raster analysis to see how the extent of mangrove forests has changed over time. (ArcGIS lab, 25 mins.)
- [Making Predictions from Multidimensional Data Using ArcGIS Image for ArcGIS Online](#): Teaches how to create a tiled imagery layer from a NetCDF file containing multidimensional sea surface temperature data and analyze data to predict coral bleaching. (ArcGIS lab, 2 hrs., 20 mins.)

Image classification

- [Introduction to Image Classification](#): Introduces options for creating thematic classified rasters in ArcGIS. (1 hr., 15 mins.)
- [Performing Supervised Pixel-Based Image Classification](#): Introduces the supervised pixel-based image classification technique for creating thematic classified rasters. (1 hr., 20 mins.)
- [Performing Unsupervised Pixel-Based Image Classification](#): Teaches how to identify computer-created pixel clusters to create thematic classified rasters in ArcGIS. (55 mins.)
- [Performing Supervised Object-Based Image Classification](#): Introduces how to classify images based on user-identified objects or segments, paired with machine learning. (1 hr., 15 mins.)
- [Performing Accuracy Assessment for Image Classification](#): Introduces the accuracy assessment technique to test raster data products using statistical analysis to understand how well they represent the study area. (50 mins.)
- [Classifying Objects Using Deep Learning in ArcGIS Pro](#): Teaches how to prepare and use data to train a model to detect whether buildings were impacted by a wildfire and how to apply and evaluate the accuracy of the model. (ArcGIS lab, 1 hr., 20 mins.)
- [Working with the ArcGIS Solution for 3D Basemaps](#): Uses a point cloud dataset to create a 3D scene with building roof forms and attributes. Teaches how to convert the data to a multipatch feature class that can be shared. (ArcGIS lab, 1 hr., 25 mins.)
- [Extracting Features with Deep Learning Using ArcGIS Image for ArcGIS Online](#): Teaches how to use ArcGIS Image for ArcGIS Online to detect buildings in imagery with deep learning. (ArcGIS lab, 35 mins.)

Related Learning Plan

- [Image Classification Using ArcGIS](#)

Suitability modeling

- [Suitability Modeling: Introduction](#): Teaches how to define a problem in terms of an analysis goal and suitability criteria, plus how to prepare data for a suitability model. (2 hrs., 40 mins.)
- [Suitability Modeling: Creating a Simple Suitability Model](#): Teaches how to create a suitability model that produces an easy-to-interpret binary result. (2 hrs., 35 mins.)
- [Suitability Modeling: Creating a Weighted Suitability Model](#): Teaches how to create a weighted suitability model and use sensitivity and error analysis to evaluate results. (4 hrs., 15 mins.)

Related Learning Plan

- [Finding the Best Place](#)

Mapping imagery

- [Creating Python Scripts for Raster Analysis](#): Discusses creating a raster object, accessing its properties, and using them in your Python scripting. (1 hr.)

Mapping imagery with drones

The following e-Learning courses cover key skills and concepts for working with drones and drone-captured imagery.

- [ArcGIS Flight Basics](#) (formerly titled *Getting Started with Site Scan for ArcGIS*): Presents the capabilities and features of cloud-based Site Scan for ArcGIS, including drone flight planning. (50 mins.)
- [ArcGIS Flight: Creating Imagery Products](#) (formerly titled *Creating Imagery Products with Site Scan for ArcGIS*): Explores workflows for creating and examining imagery products and sharing them to ArcGIS Online. (1 hr., 25 mins.)
- [ArcGIS Drone2Map Basics](#): Explores the capabilities and workflows that ArcGIS Drone2Map provides for creating accurate digital representations of physical objects and places. (2 hrs., 20 mins.)
- [Using Tile-Based Processing in ArcGIS Drone2Map](#): Teaches how to perform tile-based processing using Drone2Map and share the resulting True Orthomosaic as a tile layer for review. (ArcGIS lab, 55 mins.)

Related Learning Plan

- [Reality Mapping Using ArcGIS](#)

Deep learning (AI with imagery)

Deep learning functionality in ArcGIS enables you to easily create map layers extracted from imagery. These offerings teach why and how to use different tool options. (Get overviews of [GeoAI](#) and [Image Analysis with AI](#) capabilities.)

- [Introduction to Image Classification](#): Introduces options for creating thematic classified rasters in ArcGIS. (1 hr., 15 mins.)
- [Classifying Objects Using Deep Learning in ArcGIS Pro](#): Teaches how to prepare and use data to train a model to detect whether buildings were impacted by a wildfire and how to apply and evaluate the accuracy of the model. (ArcGIS lab, 1 hr., 20 mins.)
- [Performing Accuracy Assessment for Image Classification](#): Introduces the accuracy assessment technique to test raster data products using statistical analysis to understand how well they represent the study area. (50 mins.)
- [Unlocking Information from Imagery in ArcGIS](#): Explores how to use imagery workflows and deep learning for efficient, action-oriented problem-solving. (Story Map.)
- [Deep Learning Using ArcGIS Image for ArcGIS Online](#): Teaches how to use pretrained deep learning models from ArcGIS Living Atlas of the World to solve everyday problems. (1 hr., 45 mins.)

- [Deep Learning Using ArcGIS Pro](#): Explains how deep learning supports GIS analysis. Teaches how to use a pretrained deep learning model from ArcGIS Living Atlas of the World. (2 hrs., 15 mins.)
- [Understanding GeoAI in ArcGIS](#): Explores how organizations can leverage GeoAI capabilities across the ArcGIS system to automate workflows, create rich models of the real world, and analyze all kinds of data at scale, including imagery, 2D and 3D features, tabular data, videos, unstructured text, and time-series data. (Training seminar: Live on August 15, 2024. One-hour recording available thereafter.)
- [Extracting Features with Deep Learning Using ArcGIS Image for ArcGIS Online](#): Teaches how to use ArcGIS Image for ArcGIS Online to detect buildings in imagery with deep learning. (ArcGIS lab, 35 mins.)


Related Learning Plans

- [Image Classification Using ArcGIS](#)
- [Deep Learning Using ArcGIS](#)

ADDITIONAL INSTRUCTIONAL MATERIALS

[ArcGIS Imagery Workflows](#) is a library of authoritative resources within the ArcGIS documentation that includes an extensive gallery of tutorials, help articles, and best practices for using imagery and rasters.

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 to view alerts  while signed into Training.)
- 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: [Top 8 Tips for Educators Assigning Esri MOOCs 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.