

# Spatial Data Science: The New Frontier in Analytics



## Course Syllabus

### Section 1

#### *Introduction to Spatial Data Science*

Explore how spatial data, tools, and analysis techniques augment traditional data science. Understand that “spatial” means more than x,y coordinates and that place-based context reveals patterns in data that otherwise may be hidden. Start applying data engineering and visualization techniques in ArcGIS Pro and ArcGIS Notebooks.

### Section 3

#### *Finding Optimal Locations Using Suitability Models*

Apply widely used spatial analysis techniques to answer this universal question asked by all kinds of organizations: Where is the best location for <fill in the blank>? Perform a weighted overlay analysis that considers and ranks multiple suitability criteria. Learn how to transform data using functions to more completely represent suitability impact.

### Section 5

#### *Object Detection with Deep Learning*

Take a deep dive into extracting information from massive data using deep learning. Learn how to automate the process of detecting objects and identifying features from imagery. Practice preparing training sample data, then use a neural network to train an object detection model.

### Section 2

#### *The Spatial Approach to Predictive Analysis*

Prediction is fundamental to data science. See how incorporating spatial properties into modeling workflows deepens understanding of data and adds predictive power. Learn how to apply random forest, a widely used machine learning approach, to solve problems. Train and evaluate a model, then use it to generate robust predictions.

### Section 4

#### *Pattern Detection and Clustering*

Does a pattern have meaning or is it a product of random chance? ArcGIS includes a suite of tools to help analysts identify patterns and clusters in data and determine if they are meaningful. Learn how to apply statistical clustering methods to analyze patterns in space as well as time. Create a space-time cube, then use space-time pattern mining tools to explore spatiotemporal trends and determine where and when high and low clusters occur.

### Section 6

#### *Communicating Results with Impact*

Successful analysts and data scientists must be effective storytellers. Learn how to present a complex analysis using information products that resonate with your audience. Design and build interactive, visual stories that share the key information you want decision-makers to understand and act on.

Learn more at [go.esri.com/sds-course](https://go.esri.com/sds-course).

# Esri® MOOC

## TIPS FOR SUCCESS

Esri massive open online courses (MOOCs) are engaging, educational—and most of all, fun.  
For the best experience:

### CHECK YOUR TECHNICAL SETUP

1

Esri software is provided for your use during the course.

- ▶ Carefully read the Software section on the course catalog page to confirm you have any non-Esri software required and that your system meets all hardware requirements.
- ▶ Use a desktop computer, laptop, or tablet. Smartphones are not recommended.
- ▶ Use a browser with a PDF reader plug-in installed.
  - ▶ Make sure your firewall and browser settings allow you to view embedded video files.

2

### STAY ON TRACK IN COURSE EXERCISES

To easily move back and forth between step-by-step exercise instructions and Esri software:

- ▶ Print the instructions, use two monitors, or view the instructions on a separate device.

### MANAGE YOUR TIME

3

To earn a certificate of completion, complete all course content by the course end date.

- ▶ Plan to spend at least three hours per week on each section.
- ▶ Add the course end date to your personal calendar and set reminders to study.

4

### BE AN ACTIVE LEARNER

Practice independent learning and engage with your peers.

- ▶ Complete each section during its opening week and participate in forum discussions.
- ▶ Read weekly announcements for course updates and interesting student contributions.
- ▶ When you have a question or issue, follow the steps on the course Help page.

