PRAGMATIC
INSTITUTE

The difference between successful and unsuccessful companies is whether they are utilizing data and insights effectively to make business and technical decisions. Our expert-led data courses are designed to help organizations leverage data to drive business outcomes through high-impact training. With our experiential-learning based courses, business and data professionals come together to collaborate effectively on business objectives and execute a seamless plan so your most valuable data gets the attention it deserves.

# AI & Machine Learning

## Foundational Data Course

### Course Timeframe

4-week part-time course. *2 lectures per week.*

### Course Delivery

Live online.
Office hours are included for course duration.

### Who is This Course For?

- Individuals with a strong educational background and professionals outside of STEM with little to no experience in data who have a strong interest in learning how to leverage data science techniques and skills
- Junior business analysts, data analysts, market intelligence analysts, product operations, design operations, project managers, and professionals looking to get a foundational understanding of AI/data science techniques and learn how to leverage AI tools to solve simple to intermediate real-world business problems

### Who is This Course Not For?

Experienced data science, data analytics, or data engineering professionals

### Prerequisites:

"Data Wrangling with Python" or programming experience

### Course Learning Objectives

This course will build upon your Python knowledge and introduce you to the world of machine learning. You'll use more advanced tools to learn regression, the bias/variance tradeoff, techniques to control overfitting, scikit-learn API, classification, dimensionality reduction, clustering, and more.

### By The End of This Course, Students Will...

- Understand the basic concepts and terminology of machine learning
- Build and train simple machine learning models for supervised and unsupervised problems
- Automate the transformation of data with pipelines
- Evaluate the performance of ML algorithms and properly tune hyperparameters

### Use Case Examples

- Predict the next quarter's sales for a number of store locations
- Identify shipments that are most likely to arrive late
- Automatically categorize customers into relevant groups based on dominant characteristics
- Identify prospects with a high propensity to convert to client
- Predict customers with a high propensity to churn
- Anticipate product usage over the next month, based on past trends

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# AI & Machine Learning Course Syllabus

## Foundational Data Course

### An Eight-Module Structured Learning Path

**Module 1: Intro to AI and Machine Learning**

Basic definitions of machine learning, types of machine learning problems, training and evaluating machine learning models

**Module 2: Scikit-Learn API**

Understanding Predictors, transformers, and pipelines

**Module 3: Regression**

Building Regression models: Linear regression, regression metrics, feature engineering, regularization

**Module 4: Bias, Variance, and Overfitting**

Evaluating In-sample and out-of-sample errors, the bias-variance tradeoff, choosing hyperparameters with cross-validation, train, test, and validation sets

**Module 5: Introduction to Classification**

Building Classification models: Logistic regression, classification metrics, probabilistic models, multiclass classification

**Module 6: Classification: Predicting Customer Churn**

Feature engineering, dealing with categorical features, random forest classification, dealing with unbalanced classes

**Module 7: Dimensionality Reduction**

Principle component analysis, explained variance, choosing how many components, interpreting principal components

**Module 8: Scikit-Learn Workflow**

Using the ColumnTransformer, building custom classes, using the FunctionTransformer, imputing missing values

Includes hands on exercises and mini project