



## Introduction to AI, AI Programming & Machine Learning | AI / ML JumpStart (TTML5503)

Explore Modern AI & ML Essentials | Analytics, Algorithms, Predictive Models, Dealing with Data in the Real World & More

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### Course Snapshot

- **Course:** Introduction to Artificial Intelligence, AI Programming & Machine Learning | AI & ML JumpStart (TTML5503)
- **Duration:** 3 days
- **Audience:** This **introductory-level course** is geared for experienced Data Science Analysts, Programmers, Administrators, Architects, Managers and others **new to AI and machine learning**.
- **Hands-on Learning:** This hands-on course combines engaging expert lessons, demos and group discussions with real-world, skills-focused machine-based labs and exercises. Student machines are required.
- **Delivery Options:** This course is available for **onsite private classroom presentation, live online virtual presentation**, or can be presented in a **blended learning format**. Please also ask about our **Self-Paced / Video / QuickSkills** or **Mini-Camp / Short Course** flexible delivery options.
- **Public Schedule:** This course has active dates on our live-online open enrollment **Public Schedule**.
- **Customizable:** This course agenda, topics and labs can be further adjusted to target your specific training skills objectives, tools and learning goals. Please ask for details.

### Overview

**Introduction to Artificial Intelligence (AI) & Machine Learning (AI & ML JumpStart)** is a three-day, **foundation-level**, hands-on course that explores the fast-changing field of artificial intelligence (AI), programming, logic, search, machine learning, and natural language understanding. Students will learn current AI / ML methods, tools, and techniques, their application to computational problems, and their contribution to understanding intelligence. This course presents a wide variety of related technologies, concepts and skills in a fast-paced, hands-on format, providing students with a solid foundation for understanding and getting a jumpstart into working with AI and machine learning. Each topic area presents a specific challenge area, current progress, and approaches to the presented problem. This course sets you on the path to becoming machine learning aware. When you're done, you'll have an intuitive understanding of the right approach for any machine learning task or project. This class focuses on algorithms and intuitions.

In this course, we will cut through the math and learn exactly how machine learning algorithms work. Although there is clearly a requirement for the students to have an aptitude for math, this course is about focusing on the algorithms that will be used to create machine learning models. Using clear explanations, simple pure Python code (no libraries!) and step-by-step labs, you will discover how to load and prepare data, evaluate model skill, and implement a suite of linear, nonlinear and ensemble machine learning algorithms from scratch.

This course teaches the most valuable ML techniques and shows how to make them work for your organization. You'll only need high school / college level math to understand the algorithms. Real world use cases are provided to illustrate each new concept to ensure you're learning as you go. You'll build models for spam detection, language analysis, and image recognition as you lock in each carefully selected skill. This course provides several-follow Python-based exercises and mini-projects that puts you on the path to becoming a machine learning expert.

### Learning Objectives

This "skills-centric" course combines practical exercises designed to reinforce fundamental skills, concepts and best practices taught throughout the course. Throughout the course students will learn about and explore popular machine learning algorithms, their applicability and limitations; practical application of these methods in a machine learning environment; and practical use cases and limitations of algorithms.

Working in a hands-on lab environment led by our expert instructor, attendees will explore:

- Types of machine learning
- Linear Regression
- Perceptrons
- Logistic Regression
- Naive Bayes
- Decision Trees

- Ensemble learning
- Neural Networks

**Need different skills or topics?** If your team requires different topics or tools, additional skills or custom approach, this course may be further adjusted to accommodate. We offer additional AI, machine learning, data science, programming, Python/R and other related topics that may be blended with this course for a track that best suits your needs. Our team will collaborate with you to understand your needs and will target the course to focus on your specific learning objectives and goals.

## Audience

**Students attending this class should have a grounding in Enterprise computing.** Students attending this course should be familiar with Enterprise IT, have a general (high-level) understanding of systems architecture, as well as some knowledge of the business drivers that might be able to take advantage of applying AI.

This course is ideally suited for a wide variety of technical learners who need an introduction to the core skills, concepts and technologies related to AI programming and machine learning. Attendees might include:

- Developers aspiring to be a 'Data Scientist' or Machine Learning engineers
- Analytics Managers who are leading a team of analysts
- Business Analysts who want to understand data science techniques
- Information Architects who want to gain expertise in Machine Learning algorithms
- Analytics professionals who want to work in machine learning or artificial intelligence
- Graduates looking to build a career in Data Science and machine learning
- Experienced professionals who would like to harness machine learning in their fields to get more insight about customers

## Pre-Requisites

**Pre-Requisites:** Students should have attended or have incoming skills equivalent to those in this course:

- Basic to Intermediate IT Skills. Attendees without a programming background like Python may view labs as follow along exercises or team with others to complete them.
- Good foundational mathematics or logic skills
- No machine learning experience or advanced math skills necessary.
- Basic Linux skills, including familiarity with command-line options such as ls, cd, cp, and su

**Take Before:** Attending students should have incoming skills equivalent to those in the course(s) below, or should have attended these as a pre-requisite:

- TTPS4802 Python QuickStart (2 days)

**Take Instead:** We offer courses with similar topics coverage that offer an alternative focus or depth:

- TTML5502 Artificial Intelligence (AI) & Machine Learning for the Enterprise - Hands-on Overview (light labs – 2 days)
- TTML5504 Machine Learning Foundation (Math Emphasis) | Working with Statistics, Algorithms & Neural Networks (3 days)

**Take Next / Follow-on Courses:** This course is a core component of our **AI & Machine Learning Skills Path**, designed to train participants of all skill levels in modern AI, Machine Learning and Analytics skills across the enterprise. We offer courses in next level AI and Machine Learning, Deep Learning, Natural Language Processing, Applied Machine Learning (Chatbots, Intelligent Web) and many more related titles. Please contact us for details and next step recommendations based on your specific roles and goals.

**Enhanced Learning Support:** Please ask about our **Pre-Training Class Prep & Primer** offerings, **Skills Gap Assessment Services**, **Case Studies**, **Knowledge Check Quizzes**, **Skills Immersion Programs & Camps**, **Collaborative Mentoring Services** and **Extended Learning Support** services.

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## Course Topics / Agenda

*Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We will work with you to tune this course and level of coverage to target the skills you need most. Course agenda, topics and labs are subject to adjust during live delivery in response to student skill level, interests and participation.*

### 1. Why learn Machine Learning?

- Machine learning defined

### 2. Types of Machine Learning

- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning

### 3. Linear Regression

- Use Case: Predict the price of a house
- Build a regression model for housing prices
- Multivariate Linear Regression
- Error Measurements
- Gradient Descent
- Applications of linear regression

### 4. Understanding how to Train Data

- How to pick the right AI model
- Regularization
- Overfitting/Underfitting
- Modifying the cost function (Lasso Regression and Ridge Regression)
- Measuring how complex the model is with L1 and L2

### 5. Perceptrons

- Use Case: Natural Language Processing

- What are classifier algorithms
- The perceptron algorithm
- Coding the perceptron algorithm
- Applications
- Some drawbacks of the perceptron algorithm

### 6. Logistic Regression

- Logistic Regression (or continuous perceptron)
- Sigmoid Function
- Reducing the log loss error: The logistic regression trick
- Classifying into multiple classes - The SoftMax function

### 7. Naive Bayes

- Use-case: Spam detection model
- Building a spam detection model with real data

### 8. Decision Trees

- Use Case: Recommender System
- Building the tree: How to pick the right feature to split
- Back to recommending apps: Building our decision tree using Gini index
- Beyond questions like yes/no
- Coding a decision tree with sklearn
- A slightly larger example: Spam

detection again!

- Applications

### 9. Ensemble Learning

- What is an ensemble of learners? Why not just one really good learner?
- Bagging - Joining some classifiers together to build a stronger classifier
- Boosting - Joining some classifiers together in a smarter way to get a stronger classifier
- Applications of ensemble methods

### 10. Support Vector Machines

- Creating a new error function to build a better classifier
- How to classify points with distance
- How to classify points with classification
- Forcing the algorithm to focus on classification or distance with the c parameter
- Coding SVM in sklearn

### 11. Exploring Neural Networks

- Deep Learning
- Neural Network

**Hands-on Setup Made Simple!** All course software (limited versions, for course use only), courseware files or course notes (as applicable), labs / data sets and solutions (as applicable) are provided for you in our “easy access / no install required” high-speed remote lab environment. Our dedicated live tech team works with every student to ensure everyone is set up with working access and ready to go prior to every course start date, ensuring a smooth delivery and great hands-on experience. All your coursework can be accessed or downloaded after class, so you never lose your work or materials. Please ask for details.

### For More Information

For more information about our dedicated training services, collaborative coaching services, courseware licensing options, public course schedule, training management services, partner programs, or to see our complete list of course offerings and special offers please visit us at [www.triveratech.com](http://www.triveratech.com), email [Info@triveratech.com](mailto:Info@triveratech.com) or call us toll free at **844-475-4559**. Our pricing and services are always satisfaction guaranteed.

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