Introduction to AI & Machine Learning JumpStart (TTML5503)

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

Course Snapshot

- **Course: Introduction to AI & Machine Learning JumpStart (TTML5503)**
- **Duration**: 3 days
- **Audience**: This introductory-level hands-on course is suited for a wide variety of technical learners who need an introduction to the core skills, concepts, tech, tools and skills related to AI programming and machine learning.
- **Format / Hands-on:** This course combines engaging instructor-led presentations and practical demonstrations with hands-on programming exercises, challenge labs, use case exploration and engaging group activities. Student machines are required.
- **Flexible Delivery Options**: This course can be delivered for your team or organization **online-live (virtual)**, **onsite in-person**, **self-paced** or across our immersive **blended learning experience platform (LXP).**
- **Public Schedule**: This course is currently available on our Public Open Enrollment Schedule.
- **Customizable**: We're flexible! This course agenda, topics, labs, hours and delivery modalities can be adjusted to target your specific training skills objectives, tools and learning goals. Please ask for details.

Overview

Geared for technical professionals, our **Introduction to AI & Machine Learning JumpStart** course is a three-day, hands-on workshop style event designed to get you quickly up and running with latest skills, tools and tech in essential AI and ML, demystifying the field of artificial intelligence without drowning you in mathematics. Whether you're a budding developer or a tech enthusiast, we'll guide you through the foundations of AI and machine learning, and equip you with the knowledge, problem-solving skills and confidence needed to apply this innovative tech in real-world scenarios.

The course is rich with hands-on activities, challenge labs, knowledge checks, valuable discussions and focused projects that can be done individually or in groups. Working in a hands-on learning environment, guided by our engaging AI expert, you'll explore AI and Machine Learning essentials, practical examples, tools and best practices. You'll learn how to integrate AI and machine learning principles into real-world projects, enabling you to innovate in areas like product development, customer experience enhancement, and complex problem-solving. You'll explore the differences and applications of supervised, unsupervised, and reinforcement learning, laying the groundwork for exploration and utilization in diverse contexts. You'll learn how to employ AI and machine learning concepts for making informed, data-driven decisions that can have far-reaching impacts on various aspects of business and technology.

Throughout the course you'll gain highly-valuable, expert guided experience using cutting-edge tools and algorithms through hands-on labs, ensuring that you can confidently apply these new skills and concepts in practical scenarios. You'll leave the event well-versed and ready to apply key AI and Machine Learning concepts in your work. Whether you'll be coding algorithms, classifying data, or optimizing machine learning models, you'll have the essentials skills needed to tackle any AI-related project.

Learning Objectives

Working in a hands-on learnng environment led by our expert practitioner you'll explore:
- **Grasp AI & Machine Learning Basics**: You'll start your journey by understanding what AI and Machine Learning are, distinguishing between them, and discovering how they're applied in various fields. You'll also get a good look at practical examples of Machine Learning.
- **Decode Types of Machine Learning**: You'll navigate through the different types of machine learning, including supervised, unsupervised, and reinforcement learning, and gain insight into their distinctive applications, and explore their practical application.
- **Master Data Prep:** You'll learn and apply critical methods for cleaning and simplifying data
- **Master Algorithms:** You'll explore popular machine learning algorithms, their applicability and limitations
- **Get Hands-On:** You'll learn how to code linear regression and logistic regression algorithms in Python, and gain hands-on experience applying them in real-world scenarios in a machine learning environment working with various machine learning

packages and tools.
- **Optimize Machine Learning Models**: You'll dig into the art of model optimization, learning how to prevent underfitting and overfitting to ensure your machine learning models are accurate and reliable.
- **Conquer Classification**: You'll uncover the secrets of the perceptron algorithm and logistic classifiers, learning how to classify data effectively and carry out sentiment analysis like a pro.
- **Responsible AI Development**: You'll gain insight into the ethical considerations and responsible practices in AI, ensuring that solutions are developed with a consciousness of privacy, bias, and societal implications.
- **Venture into Generative AI**: You'll step into the fascinating world of Generative AI and Generative Adversarial Networks (GANs), exploring their structure, functionality, and the concept of latent space in generative models. After the course, you'll understand how these advanced AI models can contribute to your projects.

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.

Audience & Pre-Requisites

This introductory-level hands-on course is suited for a wide variety of technical learners who need an introduction to the core skills, concepts, tech, tools and skills related to AI programming and machine learning.

Suitable 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

Pre-Requisites

Pre-Requisites: Students should have attended or have incoming skills equivalent to those in this course:
- Basic Understanding of Python as well as familiarity with Python Libraries (Pandas and Numpy, etc.). Attendees without Python background may view labs as follow along exercises or team with others to complete them.
- Basic Linux skills, including familiarity with command-line options such as ls, cd, cp, and su
- Basic Math and Problem-Solving Skills
- Understanding of Basic Data Structures

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:
- TTPS4800   Introduction to Python (3 days)
- TTPS4873   Introduction to Python in Data Science and Machine Learning (3 days)

Related helpful courses:
- TTPS4880   Hands-on Practical Python for Data Prep, Data Wrangling & Transformation (3 days)

Take Next / Follow-on Courses: This course is a core component of our **AI & Machine Learning Skills Path**, designed to trainer 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 Services: Please also ask about our **Pre-Training Class OnRamp & Prep / Primer** offerings, **Skills Gap Assessment Services**, **Case Studies**, **Knowledge Check Quizzes**, **Skills Immersion Programs & Camps**, **Collaborative Mentoring Services** and **Extended Learning Support** & **Post Training** services.

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. **What is AI and Machine Learning**
- Is machine learning difficult?
- What is artificial intelligence
- Difference between AI and machine learning
- Machine learning examples

2. **Types of Machine Learning**
- Three different types of machine learning: supervised, unsupervised, and reinforcement learning
- Difference between labeled and unlabeled data
- The difference between regression and classification, and how they are used

3. **Linear Regression**
- Fitting a line through a set of data points
- Coding the linear regression algorithm in Python
- Using Turi Create to build a linear regression model to predict housing prices in a real dataset
- What is polynomial regression
- Fitting a more complex curve to nonlinear data
- Examples of linear regression

4. **Optimizing the Training Process**
- What is underfitting and overfitting
- Solutions for avoiding overfitting
- Testing the model complexity graph, and regularization
- Calculating the complexity of the model
- Picking the best model in terms of performance and complexity

5. **The perceptron Algorithm**
- What is classification
- Sentiment analysis
- How to draw a line that separates points of two colors
- What is a perceptron
- Coding the perceptron algorithm in Python and Turi Create

6. **Logistic Classifiers**
- Hard assignments and Soft assignments
- The sigmoid function
- Discrete perceptrons vs. Continuous perceptrons
- Logistic regression algorithm for classifying data
- Coding the logistic regression algorithm in Python

7. **Measuring Classification Models**
- Types of errors a model can make
- The confusion matrix
- what are accuracy, recall, precision, F-score, sensitivity, and specificity
- what is the ROC curve

8. **The Naive Bayes Model**
- What is Bayes theorem
- Dependent and independent events
- The prior and posterior probabilities
- Calculating conditional probabilities
- using the naive Bayes model
- Coding the naive Bayes algorithm in Python

9. **Decision Trees**
- What is a decision tree
- Using decision trees for classification and regression
- Building an app-recommendation system using users' information
- Accuracy, Gini index, and entropy
- Using Scikit-Learn to train a decision tree

10. **Neural Networks**
- What is a neural network
- Architecture of a neural network: nodes, layers, depth, and activation functions
- Training neural networks

- Potential problems in training neural networks
- Techniques to improve neural network training
- Using neural networks as regression models

11. **Responsible AI: Navigating the Grey Areas**
- Understanding Ethical Implications in AI
- Grasp the moral complexities in recommendation systems.
- Bias and Fairness in Recommenders
- Dissect potential biases in AI-driven recommendations.

12. **Introduction to Generative AI**
- Understanding Generative AI
- How Generative AI fits into the broader AI and Machine Learning landscape
- Differences between generative and discriminative models
- Introduction to Generative Adversarial Networks (GANs)
- Understanding the concept of latent space in generative models
- Basic structure and components of GANs: generator and discriminator

13. **OPTIONAL: Applications of Generative AI in Business**
- Improving customer experience: Using generative AI for personalized content creation, such as emails, ads, and product descriptions
- Product development: Using GANs for generating new ideas for products, fashion designs, and more
- Data augmentation: How generative models can create additional training data for other machine learning models, improving their performance

- Content creation: Using AI for generating realistic images, music, text, and more
- Risk management: Using generative AI to simulate different business scenarios and outcomes
- Healthcare: Generating synthetic medical data for research while preserving patient privacy

Bonus Content / Time Permitting

14. **Bonus: Support vector machine and the Kernel methods**
- What a support vector machine

- Which of the linear classifiers for a dataset has the best boundary
- Using the kernel method to build nonlinear classifiers
- Coding support vector machines and the kernel method in Scikit-Learn

15. **Bonus: Ensemble learning**
- What ensemble learning is
- Using bagging to combine classifiers
- Using boosting to combine classifiers
- Ensemble methods: random forests, AdaBoost, gradient

boosting, and XGBoost

16. **Bonus: Real-World Example: Data Engineering and ML**
- Cleaning up and preprocessing data to make it readable by our model
- Using Scikit-Learn to train and evaluate several models
- Using grid search to select good hyperparameters for our model
- Using k-fold cross-validation to be able to use our data for training and validation simultaneously

Setup Made Simple! Learning Experience Platform (LXP)

All applicable course software, digital courseware files or course notes, labs, data sets and solutions, live coaching support channels and rich extended learning and post training resources are provided for you in our "easy access, no install required" user friendly online **Learning Experience Platform (LXP),** remote lab and content environment. The LXP also includes our integrated expert closed-system classroom assistant, **CodeCoach.AI**, our unique AI-driven tutor ready to help answer questions and provide additional guidance without risk to your privacy, content security or bring subject to misinformation.

Access periods vary by course. We'll collaborate with you to ensure your team is set up and ready to go well in advance of the class. Please inquire about set up details and options for your specific course of interest.

For More Information

For more information about our training services (instructor-led, self-paced or blended), collaborative coaching services, robust Learning Experience Platform (LXP), Career Experiences, public course schedule, partner programs, courseware licensing options or to see our complete list of course offerings, solutions and special offers, please visit us at **www.triveratech.com**, email **Info@triveratech.com** or call us toll free at **844-475-4559.** Our pricing and services are always satisfaction guaranteed.

TRIVERA TECHNOLOGIES ● **Collaborative IT Training, Coaching & Skills Development Solutions**
www.triveratech.com ● **toll free +1-844-475-4559** ● **Info@triveratech.com** ● **Twitter TriveraTech**

ONSITE, ONLINE & BLENDED TRAINING SOLUTIONS ● PUBLIC / OPEN ENROLLMENT COURSES
LEARNING EXPERIENCE PLATFORM (LXP) ● COACHING / MENTORING ● ASSESSMENTS ● CONTENT LICENSING & DEVELOPMENT
LEARNING PLAN DEVELOPMENT ● SKILLS IMMERSION PROGRAMS / RESKILLING / NEW HIRE / BOOT CAMPS
PARTNER & RESELLER PROGRAMS ● CORPORATE TRAINING MANAGEMENT ● VENDOR MANAGEMENT SERVICES

Trivera Technologies is a Woman-Owned Small-Business Firm