



Production-Ready Machine Learning: Designing Scalable, Reliable, and Real- World AI Systems



AGILE LEADERS
Training Center



Production-Ready Machine Learning: Designing Scalable, Reliable, and Real-World AI Systems

Course Overview:

In today's fast-paced digital landscape, deploying scalable and reliable machine learning systems is no longer optional — it is essential. *Production-Ready Machine Learning: Designing Scalable, Reliable, and Real-World AI Systems* is an intensive, practical training program grounded in the best practices from the authoritative book “Designing Machine Learning Systems.” This course demystifies the challenges of transforming ML prototypes into robust, real-world AI systems. Participants will explore the entire lifecycle of production-ready ML — from system design and feature engineering techniques to ML model deployment, continuous training, model versioning, and monitoring.

Target Audience:

- Machine Learning Engineers
- AI System Architects
- Data Scientists
- DevOps Engineers
- Software Engineers in ML Ops
- AI/ML Product Managers
- Cloud Infrastructure Engineers

Targeted Organisational Departments:

- AI/ML Engineering
- Data Science & Advanced Analytics
- IT Operations & Infrastructure
- Digital Transformation
- Product Development & Innovation
- Quality Assurance & Monitoring
- Cloud & DevOps Teams

Targeted Industries:

- Technology & SaaS
- Healthcare & Biotech
- Finance & FinTech
- E-commerce & Retail
- Telecommunications
- Manufacturing & IoT
- Automotive Self-driving Systems
- Logistics & Smart Supply Chain

Course Offerings:

By the end of this course, participants will be able to:

- Design and implement scalable machine learning system architectures.
- Build production-ready ML pipelines and deploy models to cloud and edge environments.
- Apply data-centric AI principles to optimize feature engineering and data pipelines.
- Monitor, debug, and maintain ML systems using observability tools.
- Implement iterative ML development and continuous training practices.
- Manage model versioning and lifecycle with real-time deployment strategies.
- Ensure robust performance, fairness, and low-latency operation of AI systems in production.

Training Methodology:

This course integrates real-world machine learning case studies, interactive labs, and group-based projects that simulate production machine learning environments. Trainees will engage in iterative machine learning development cycles, explore debugging techniques for machine learning systems, and assess model performance using live monitoring methods. Each module blends conceptual discussions, hands-on exercises, and feedback-driven refinement of deployed artificial intelligence systems.

Course Toolbox:

- Course ebook & Slides
- Jupyter Notebooks with example ML pipelines
- Code templates for real-time ML systems
- Tools: MLflow, TensorFlow Serving, Streamlit, Airflow, Docker, Prometheus/Grafana
- Access to curated reading materials, case studies & GitHub repos
- Model evaluation checklists & deployment templates
- Monitoring dashboards for ML performance
- Troubleshooting & debugging flowcharts
- Production ML best practices cheat sheets

Course Agenda:



Day 1: Foundations of Production-Ready ML Systems

- **Topic 1:** Introduction to Machine Learning Systems in Production
- **Topic 2:** Designing Reliable and Scalable ML Systems
- **Topic 3:** Differences Between Traditional Software and ML Engineering
- **Topic 4:** ML System Requirements: Reliability, Scalability, Maintainability, Adaptability
- **Topic 5:** Overview of Real-World ML Use Cases and Business Impact
- **Topic 6:** Introduction to Iterative ML Development and Deployment
- **Reflection & Review:** Assessing readiness for real-world ML system design

Day 2: Data-Centric AI and Feature Engineering

- **Topic 1:** The Critical Role of Data in ML System Performance
- **Topic 2:** Creating and Validating High-Quality Datasets for Production
- **Topic 3:** Feature Engineering Techniques and Data Preprocessing Best Practices
- **Topic 4:** Data Versioning and Validation in ML Pipelines
- **Topic 5:** Understanding Train-Serving Skew and Data Distribution Shifts
- **Topic 6:** Managing ML Data Infrastructure at Scale
- **Reflection & Review:** Data-centric challenges in scalable machine learning

Day 3: Model Development, Evaluation, and Deployment

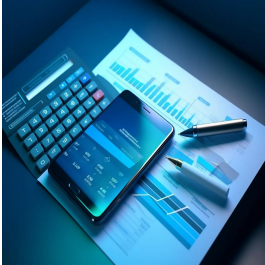
- **Topic 1:** Building Robust ML Models for Real-World Applications
- **Topic 2:** Model Selection, Training Strategies, and Evaluation Metrics
- **Topic 3:** Deployment Strategies: Online vs Batch Prediction
- **Topic 4:** Infrastructure for ML Model Deployment and Integration
- **Topic 5:** Model Versioning Tools and Continuous Deployment Pipelines
- **Topic 6:** Debugging ML Systems and Handling Edge Cases
- **Reflection & Review:** Strengthening ML model deployment pipelines

Day 4: Monitoring, Retraining, and Observability

- **Topic 1:** ML Model Monitoring in Production Environments
- **Topic 2:** Detecting and Responding to Concept Drift and Data Shifts
- **Topic 3:** Continual Learning and Retraining Cycles
- **Topic 4:** Observability Tools and Logging for ML Systems
- **Topic 5:** ML Reliability Engineering: Failures, Alerts, and Mitigations
- **Topic 6:** Real-Time ML Pipelines and Streaming Data Considerations
- **Reflection & Review:** ML lifecycle management and observability

Day 5: Scaling Training Course Categories

Topic 1: Scaling AI Systems: From Prototypes to Global Infrastructure
 AI: From Prototypes to Global Infrastructure
 Performance: From Prototypes to Global Infrastructure
 Business Model: From Prototypes to Global Infrastructure
 Study: From Prototypes to Global Infrastructure
 Practice: From Prototypes to Global Infrastructure
 Review: From Prototypes to Global Infrastructure



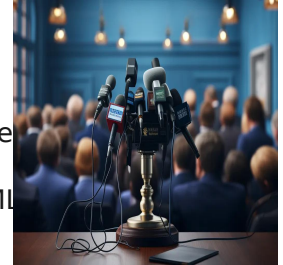
FAQ: Finance and Accounting Training Courses



Agile PM and Project Management Training Courses

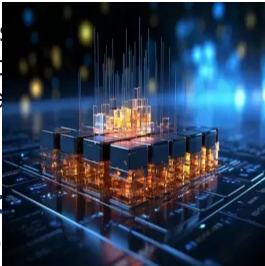


Certified Courses By International Bodies



Communication and Public Relations Training Courses

What specific qualifications or prerequisites are needed for participants before enrolling in the course?



Data Analytics Training and Data Science Courses



Environment & Sustainability Training Courses



Governance, Risk and Compliance Training Courses



Human Resources Training and Development Courses

Each day's session is generally structured to last around 4-5 hours, with breaks and interactive activities included. The total course duration spans five days, approximately 20-25 hours of instruction.

What's the difference between deploying a model and making it production-ready?



IT Security Training & IT Training Courses



Leadership and Management Training Courses



Legal Training, Procurement and Contracting Courses



Maintenance Training and Engineering Training Courses

How This Course is Different from Other Production ML Courses:

Unlike general-purpose ML bootcamps, *Production-Ready Machine Learning* is structured around real-world requirements for reliability, scalability, and adaptability, drawn directly from the acclaimed reference "Designing Machine Learning Systems." It encompasses not only model development but also critical infrastructure design, continuous deployment, monitoring, and feedback loops. The curriculum is rich in use cases and practical challenges faced by companies like Netflix, Uber, and Google. Trainees gain hands-on experience with ML observability tools, iterative workflows, and scalable ML model deployment pipelines. Additionally, the course includes production ML best practices for debugging, data versioning, fairness checks, and retraining strategies — ensuring you are equipped for real-world success, not just academic exercises.



Training Course Categories



Marketing, Customer Relations, and Sales Courses



Occupational Health, Safety and Security Training Courses



Oil & Gas Training and Other Technical Courses



Personal & Self-Development Training Courses



Quality and Operations Management Training Courses



Secretarial and Administration Training Courses

Training Cities



Accra - Ghana



Amman - Jordan



Amsterdam - Netherlands



Baku - Azerbaijan



Bali - Indonesia



Bangkok - Thailand



Barcelona - Spain



Cairo - Egypt



Cape town - South Africa



Casablanca - Morocco



Doha - Qatar



Dubai - UAE



Geneva - Switzerland



Istanbul - Turkey



Jakarta - Indonesia



Johannesburg - South Africa

Training Cities



Kuala Lumpur - Malaysia



Langkawi - Malaysia



London - UK



Madrid - Spain



Manama - Bahrain



Milan - Italy



Nairobi - Kenya



Paris - France



Phuket - Thailand



Prague - Czech Republic



Rome - Italy



Sharm El-Sheikh - Egypt



Tbilisi - Georgia



Tokyo - Japan



Vienna - Austria



Zanzibar - Tanzania



AGILE LEADERS
Training Center

Training Cities



**Zoom - Online
Training**

WHO WE ARE

Agile Leaders is a renowned training center with a team of experienced experts in vocational training and development. With 20 years of industry experience, we are committed to helping executives and managers replace traditional practices with more effective and agile approaches.

OUR VISION

We aspire to be the top choice training provider for organizations seeking to embrace agile business practices. As we progress towards our vision, our focus becomes increasingly customer-centric and agile.

OUR MISSION

We are dedicated to developing value-adding, customer-centric agile training courses that deliver a clear return on investment. Guided by our core agile values, we ensure our training is actionable and impactful.

WHAT DO WE OFFER

At Agile Leaders, we offer agile, bite-sized training courses that provide a real-life return on investment. Our courses focus on enhancing knowledge, improving skills, and changing attitudes. We achieve this through engaging and interactive training techniques, including Q&As, live discussions, games, and puzzles.



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