# **Module 1, Lesson 1: Introduction to ML**

**Duration: 1 hour total instruction time**

## **Learning Objectives**

By the end of this lesson, students will be able to:

· Define machine learning and distinguish it from traditional programming approaches

· Differentiate between supervised, unsupervised, self-supervised, and reinforcement learning paradigms

· Identify real-world African use cases that map to each paradigm

· Navigate the course structure and understand assessment expectations

· Set up their learning environment for the course

## **Detailed Outline**

### **1. Opening Content Video: "Welcome to Machine Learning" (4-5 minutes)**

Content Overview:

· Brief instructor introduction and course overview

· Motivation: How AI is changing lives (mostly pointing to GenAI); focus on relatable example (Africa context)

· What makes this course unique (You will build production ready ML Solutions to relatable problems)

· Course roadmap visualization (15 lessons, 4 modules)

· Preview of the three ML paradigms students will learn today

Key Messages:

· ML is transforming African industries and communities

· The four machine-learning paradigms and how data availability steers the choice among them

### **2. Reading/Text: "Understanding Machine Learning Fundamentals" (15-20 minutes)**

· Section A: What is Machine Learning?

o What is and what isn’t ML (Small game: Provide examples of smart tech and ask if it is ML; and provide features that make it qualify as ML). Do not provide feedback.

o Explain what is ML, and bring back their answers to see if there is a change of mind

o Provide feedback for both correct and incorrect matching.

· Section B: The Four Learning Paradigms (16-20 minutes)

o Supervised Learning (4-5 minutes)

§ Provide examples (may be interactive), what would change to move from one paradigm to another.

o Unsupervised Learning (4-5 minutes)

o Self-Supervised Learning (4-5 minutes)

o Reinforcement Learning (4-5 minutes)

· For each of the readings, embed formative assessment, with hints of why it is or isn’t correct.

### **3. Hands-on Lab: "Exploring ML Paradigms with African Data" (15-20 minutes)**

Objective: Experience all four ML paradigms using African-contextualized datasets

Activity Structure:

· Setup (3 minutes):

* Environmental set up

· Supervised Learning Exercise (5 minutes):

* Load a pre-prepared dataset
* Choose the input and the output
* Choose the learning type
* Modify parameters and observe prediction changes
* Train the model to learn the best parameter

· Unsupervised Learning Exercise (4 minutes):

o Same as above with discrete classes

· Self-Supervised Learning Exercise (4 minutes):

o Masked word prediction

· Reinforcement Learning Exercise (4 minutes):

o Learn the policy

### **4. Formative Assessment (Autograded)**

* multiple‑choice,
* drag‑and‑drop,
* short response

**5. Summary video (Key take aways, and what’s next)**

* Key takeaways
* Transition to next lesson

**6. Optional activity (lab) and link to other helpful resources for those who want to challenge themselves**

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