**AI Testing Learning Modules for Testers**

**🔹 Module 1: AI Testing Fundamentals**

* What is AI/ML?
* What is an AI model?
* Types of AI models (classification, regression, NLP, vision)

# Classification Models

Description: Predicts a category or label from input data.

## Examples:

* Spam Detection: Email is classified as Spam or Not Spam.
* Disease Prediction: Patient is Diabetic or Non-Diabetic.
* Sentiment Analysis: Review is Positive, Negative, or Neutral.

## QA Relevance:

* Bug classification (UI bug, API bug, etc.)
* Test case prioritization (high-risk vs low-risk)

# Regression Models

Description: Predicts a continuous numeric value.

## Examples:

* House Price Prediction: Predict price based on features.
* Stock Price Forecasting: Estimate future stock value.
* Temperature Prediction: Predict tomorrow’s temperature.

## QA Relevance:

* Performance testing (e.g., response time prediction)
* Test data generation with realistic values

# NLP (Natural Language Processing) Models

Description: Processes and understands human language.

## Examples:

* Chatbots: GenAI assistants like ChatGPT.
* Language Translation: English to Hindi.
* Text Summarization: Summarize long articles.

## QA Relevance:

* Chatbot testing
* Test case generation from requirements
* Multilingual support validation

# Vision Models (Computer Vision)

Description: Analyzes and understands images or videos.

## Examples:

* Face Recognition: Unlock phone using face.
* Object Detection: Detect cars, pedestrians.
* Medical Imaging: Detect tumors in X-rays.

## QA Relevance:

* UI layout comparison
* OCR validation (e.g., scanned forms)

# Generative Models

Description: Generates new data similar to training data.

## Examples:

* Image Generation: Create images from text.
* Text Generation: Write articles or code.
* Music Generation: Compose music.

## QA Relevance:

* Test data generation
* Mock API response creation
* AI-generated content validation

# Reinforcement Learning Models

Description: Learns by trial and error to maximize rewards.

## Examples:

* Game Playing: AI learns to play chess.
* Robotics: Robot learns to walk.
* Self-driving Cars: Learn to drive safely.

## QA Relevance:

* RPA testing
* Game testing
* Self-learning system validation
* What is AI testing and why is it different from traditional testing?  **Testing AI-based systems** (like chatbots, recommendation engines, image classifiers, etc.)
*  Or using **AI tools to assist in testing** traditional software
*  Validate model predictions (classification, regression)
*  Test NLP responses (chatbots, translation)
*  Check image recognition accuracy (vision models)
*  Monitor model drift over time
*  Evaluate fairness and bias in predictions
*  Use AI tools to auto-generate test cases or detect flaky tests

📌 *Goal:* Understand what you're testing and why.

**🔹 Module 2: Key AI Testing Concepts**

* Accuracy, Precision, Recall, F1 Score
* Confusion Matrix
* Bias, Fairness, and Explainability
* Overfitting vs Underfitting

📌 *Goal:* Learn how to evaluate AI model performance.

**🔹 Module 3: Data Testing for AI**

* Importance of training and test data
* Data quality checks
* Data drift and concept drift
* Tools: pandas, Great Expectations

📌 *Goal:* Learn how to validate the data that powers AI.

**🔹 Module 4: Testing AI Models (Manual + Automation)**

* How to test AI predictions
* Edge case testing
* Exploratory testing for AI behavior
* Using Postman or Python to test AI APIs (e.g., sentiment analysis)

📌 *Goal:* Learn how to test AI outputs and behavior.

**🔹 Module 5: AI-Powered Testing Tools**

* Tools: **Testim**, **Applitools**, **TestSigma**, **Mabl**
* Self-healing tests
* Visual AI testing
* Smart test generation

📌 *Goal:* Use AI to improve your test automation.

**🔹 Module 6: Prompt Engineering for Testers**

* What is prompt engineering?
* How to use ChatGPT or Copilot to:
  + Generate test cases
  + Create test data
  + Write test plans

📌 *Goal:* Use GenAI tools to boost your productivity.

**🔹 Module 7: Python for AI Testing**

* Python basics (variables, loops, functions)
* Working with APIs using requests
* Data handling with pandas
* Writing test scripts with pytest

📌 *Goal:* Build automation around AI testing using Python.

**🔹 Module 8: Build a Mini AI Testing Project**

* Choose a public AI model (e.g., sentiment analysis, image classifier)
* Write test cases
* Validate predictions
* Document results

📌 *Goal:* Create a GitHub-ready project to showcase in interviews.