# Artificial Intelligence Glossary

## Artificial Intelligence (AI)

Computer systems that can think, learn, and make decisions like humans.

## Narrow AI

AI designed for a specific task, like a chatbot or spam filter.

## General AI

AI that can solve any problem like a human (not real yet).

## Super AI

AI smarter than humans (future possibility).

## Machine Learning (ML)

A type of AI that learns from data to make predictions.

## Deep Learning

A subset of ML using neural networks with many layers.

## Computer Vision

AI that can understand and analyze images or videos.

## Natural Language Processing (NLP)

AI that understands and processes human language.

## Automation vs AI

Automation follows fixed rules. AI adapts and learns.

## Training Data

Information used to teach AI models.

## Model

The 'brain' AI creates by learning patterns from data.

## Deployment

Putting an AI model into real-world use.

## Bias

Unfair or skewed results in AI due to bad data or design.

## Explainable AI

AI that can explain why it made a decision.

## Accuracy

How often predictions are correct.

## Precision

Of all predicted positives, how many were right.

## Supervised Learning

Learning from labeled data.

## Unsupervised Learning

Finding patterns from unlabeled data.

## Reinforcement Learning

Learning by reward or punishment feedback.

## Classification

Sorting data into groups.

## Regression

Predicting numbers like price or temperature.

## Clustering

Grouping similar items together.

## Overfitting

Model works on training data but fails on new data.

## Underfitting

Model too simple, misses patterns.

## Feature Engineering

Improving input data to boost model performance.

## Feature Scaling

Adjusting data ranges to be similar.

## Confusion Matrix

Table showing correct and incorrect predictions.

## Precision, Recall, F1

Measures of prediction quality.

## ROC Curve

Graph showing model performance.

## Hyperparameter

A setting chosen before training (like learning rate).

## Tuning

Finding best hyperparameter values.

## Neural Network

Model inspired by the brain’s neurons.

## Neuron (Perceptron)

Small unit in a network that processes input to output.

## Activation Function

Math rule that decides neuron output.

## CNN (Convolutional Neural Network)

Neural network for images.

## RNN (Recurrent Neural Network)

Neural network for sequences (like text).

## LSTM

Special RNN for long-term memory.

## Batch Size

Number of samples in one training step.

## Epoch

One full pass through training data.

## Gradient Descent

Method to reduce error during training.

## Learning Rate

Step size during gradient descent.

## Dropout

Randomly turning off neurons to prevent overfitting.

## Transfer Learning

Using pre-trained models for new tasks.

## GAN (Generative Adversarial Network)

AI that creates new data (like fake images).

## Autoencoder

Neural network for compressing and reconstructing data.

## Dataset Augmentation

Creating new data by modifying old samples.

## Tokenization

Splitting text into words or sentences.

## Stemming

Cutting words down to their root form.

## Lemmatization

Reducing words to their dictionary form.

## Stop Words

Common words removed in processing (like 'the').

## Bag of Words (BoW)

Representing text by word frequency.

## TF-IDF

Measures word importance in a document.

## Word Embedding

Representing words as numeric vectors.

## Word2Vec, GloVe, FastText

Popular word embedding methods.

## Language Model

Predicts the next word in a sequence.

## n-gram

A sequence of n words.

## Sentiment Analysis

Detects positive or negative tone in text.

## NER (Named Entity Recognition)

Finds names, places, dates in text.

## POS Tagging

Assigns part of speech (noun, verb) to words.

## Machine Translation

Translating text from one language to another.

## Speech-to-Text

Converts spoken words to text.

## Text-to-Speech

Converts text to spoken words.

## Chatbot

AI that answers questions using NLP.

## LLM (Large Language Model)

Big NLP models like GPT or BERT.

## TensorFlow

Popular open-source ML library.

## PyTorch

Flexible deep learning framework.

## Keras

Simple API for deep learning models.

## Scikit-learn

Python library for machine learning.

## OpenCV

Library for computer vision tasks.

## Hugging Face Transformers

Library for NLP pre-trained models.

## Google AI Platform

Cloud platform for AI development.

## AWS SageMaker

Amazon service for ML training and deployment.

## Azure Machine Learning

Microsoft’s AI development platform.

## Healthcare AI

AI for disease detection and medical imaging.

## Finance AI

AI for fraud detection and credit scoring.

## Retail AI

AI for recommendations and stock management.

## Manufacturing AI

AI for predictive maintenance and quality control.

## Transportation AI

AI for self-driving cars and traffic prediction.

## Education AI

AI for personalized learning and grading.

## MLOps

Combines ML with operations for managing AI models.

## Edge AI

Running AI directly on devices instead of cloud.

## Future AI Trends

Explainable AI, federated learning, AI regulation, human-AI teamwork.