

## **UNIT I – INTRODUCTION TO ARTIFICIAL INTELLIGENCE**

### **1.1 Definition and Scope of AI**

#### **Definition of Artificial Intelligence (AI)**

Artificial Intelligence is the branch of computer science that aims to create machines or software capable of thinking, learning, and making decisions like humans.

In simple terms, AI is the ability of a machine to perform tasks that normally require human intelligence, such as problem-solving, understanding language, recognizing patterns, and making prediction

#### **Scope of Artificial Intelligence**

AI covers a wide range of fields. The major areas included in the scope are:

##### **1. Machine Learning (ML)**

Systems learn from data and improve their performance without being explicitly programmed.

Examples: prediction systems, recommendation engines.

##### **2. Natural Language Processing (NLP)**

AI that understands and processes human language.

Examples: chatbots, translators, voice assistants.

##### **3. Computer Vision**

AI that enables computers to interpret images and videos.

Examples: face recognition, medical image analysis.

##### **4. Robotics**

AI-powered robots that can perform tasks autonomously.

Examples: industrial robots, service robots.

##### **5. Expert Systems**

AI programs that mimic human experts in particular domains.

Examples: medical diagnosis systems, financial advisory systems.

## **6. Neural Networks & Deep Learning**

Systems inspired by the human brain that learn complex patterns.

Examples: speech recognition, autonomous driving.

## **7. Planning and Decision Making**

AI that can plan actions, solve problems, and make strategic decisions.

Examples: logistics planning, game-playing AI.

## **8. Speech Recognition**

AI that can convert spoken language into text.

Examples: voice search, call-center automation.