Chapter 1 -Introduction to Artificial Intelligence (AI)

What is Artificial Intelligence (AI)?

- AI refers to a computer performing tasks that appear to be intelligent or rational.
- It enables machines to mimic human cognitive functions like learning, problem-solving, and decision-making.

Examples of AI Applications

- **Recognizing Faces** – Used in security systems, social media tagging, and biometric authentication.
- **Playing Games** – AI has beaten human players in chess (Deep Blue) and Go (AlphaGo).
- **Understanding Language** – AI is used in voice assistants (Siri, Alexa), translation apps, and chatbots.

Key Topics in AI

1. **Search**
   - AI uses search algorithms to find solutions in a large problem space.
   - Examples: Pathfinding in maps, chess game moves.
2. **Knowledge Representation**
   - AI systems store and process knowledge to make decisions.
   - Example: Expert systems for medical diagnosis.
3. **Uncertainty**
   - AI deals with incomplete or uncertain information using probability and logic.
   - Example: Weather prediction models.
4. **Optimization**
   - AI finds the best possible solution to a given problem.
   - Example: Route optimization in delivery services.
5. **Machine Learning (ML)**
   - AI models learn from data to make predictions or decisions.
   - Example: Spam email filtering.
6. **Neural Networks**
   - Modeled after the human brain, used in deep learning.
   - Example: Image recognition in autonomous vehicles.
7. **Natural Language Processing (NLP)**

- AI enables computers to understand and generate human language.
- Example: ChatGPT, Google Translate.

Conclusion

- AI is revolutionizing various fields with its ability to process and analyze large amounts of data.
- This course will explore fundamental AI concepts, techniques, and applications.