ARTIFICIAL INTELLIGENCE SYLLABUS

Module 1: Introduction

- Evolution of AI
- State of the Art
- Different Types of Artificial Intelligence
- Applications of AI
- Subfields of AI
- Intelligent Agents
    - Structure of Intelligent Agents
    - Environments

Module 2: Problem Solving Based on Searching

- Introduction to Problem Solving by Searching Methods
- State Space Search
- Uninformed Search Methods
    - Uniform Cost Search
    - Breadth-First Search
    - Depth-First Search
    - Depth-Limited Search
    - Iterative Deepening Depth-First Search
- Informed Search Methods
    - Best-First Search
    - A* Search

Module 3: Local Search and Adversarial Search

- Local Search Algorithms
    - Hill-Climbing Search
    - Simulated Annealing
    - Genetic Algorithm
- Adversarial Search

    - Game Trees and Minimax Evaluation
    - Elementary Two-Player Games (e.g., Tic-Tac-Toe)
    - Minimax with Alpha-Beta Pruning

Module 4: Logic and Reasoning

- Introduction to Logic and Reasoning
- Propositional Logic
- First-Order Logic
- Inference in First-Order Logic
    - Unification
    - Forward Chaining
    - Backward Chaining
    - Resolution

Module 5: Uncertain Knowledge and Reasoning

- Quantifying Uncertainty
- Bayes' Rule
- Bayesian Belief Network
- Approximate Inference in Bayesian Networks

Module 6: Planning

- Classical Planning
- Planning as State-Space Search
- Forward Search
- Backward Search
- Planning Graphs
- Hierarchical Planning
- Planning and Acting in Nondeterministic Domains
    - Sensor-less Planning
    - Multiagent Planning

Module 7: Communicating, Perceiving, and Acting

- Communication
    - Fundamentals of Language
    - Probabilistic Language Processing
    - Information Retrieval
    - Information Extraction
- Perception
    - Image Formation
    - Object Recognition