Faculty of Engineering & Technology

Ph.D. (Artificial Intelligence) Admission Test

Syllabus Section B

Applications of AI. Advanced search Techniques, Intelligent Agents and Environments, Knowledge representation & reasoning.

Foundations and History of AI, Current trends, Intelligent Agents and Environments, The Nature of Environments, Structure of Agents, Problem-Solving Agents, Search Algorithms, Uninformed Search Strategies, Informed (Heuristic) Search Strategies, Heuristic Functions, Local Search, Adversarial Search and Games, Heuristic Alpha–Beta Tree Search, Monte Carlo Tree Search, Constraint Satisfaction Problems, Backtracking Search for CSPs.

Logical and Knowledge-Based Agents, The Wumpus World, Propositional Logic and Theorem Proving, First-Order Logic, Syntax, Semantics and inferencing in First-Order Logic, Unification, Forward and Backward Chaining, Resolution, Knowledge Representation: Ontological Engineering, Categories and Objects, Events, Mental Objects and Modal Logic, Reasoning Systems for Categories, Automated Planning: Definitions and Algorithms.

Major applications of AI: Natural Language Processing: Language Understanding and Machine Translation, Computer Vision: image features, classifying images and object detection, Robotics: Perception, Planning and Control, Limitations of AI, The Ethics of AI, The Future of AI, AI Components, AI Architectures.

Machine Learning Techniques, Supervised, Unsupervised, and Semi-Supervised Learning, Reinforcement Learning, Fuzzy Logic, Artificial Neural Networks, Evolutionary algorithms, Natural Language Processing, Image Processing & Computer Vision, Edge detection, Segmentation, CNN.

Basic statistics: Random variables, mean, median, mode, geometric mean, Probability Theory, Probability Distributions, Bayes Theorem, Measure of Dispersion, Statistical Tests, Analysis of Variance.