**(20EA101) BASICS OF ARTIFICIAL INTELLIGENCE**

*(only for Specialization AI&ML)*

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| **Semester** | **Hours/Week** | | | | **C** | **Marks** | | |
| **L** | **T** | **P/D** | **J** | **CIE** | **SEE** | **Total** |
| III | 3 | - | - | 2 | 4 | - | - | 100 |
| **Pre-requisite** | Introduction to Programming, Mathematics | | | | | | | |
| **Note** | * + - 1. The evaluation weightage of the Course is L:P/D:J :: 3 : 0 : 1       2. The lecture, P/D and J component are evaluated separately as mentioned in the regulations. | | | | | | | |

**COURSE OUTCOME**

At the end of the course the student will be able to:

1. Build intelligent agents for search and games
2. Solve AI problems through programming with Python
3. Learning optimization and inference algorithms for model learning
4. Design and develop programs for an agent to learn and act in a structured environment

**UNIT-I**

**Introduction:** Concept of AI, history, current status, scope, agents, environments, Problem Formulations, Review of tree and graph structures, State space representation, Search graph and Search tree.

**UNIT-II**

**Search Algorithms:**Random search, Search with closed and open list, Depth first and Breadth first search, Heuristic search, Best first search, A\* algorithm, Game Search.

**UNIT-III**

**Probabilistic Reasoning**: Probability, conditional probability, Bayes Rule, Bayesian Networks- representation, construction and inference, temporal model, hidden Markov model.

**UNIT-IV**

**Markov Decision process:** MDP formulation, utility theory, utility functions, value iteration, policy iteration and partially observable MDPs. 5.

**UNIT-V**

**Reinforcement Learning** Passive reinforcement learning, direct utility estimation, adaptive dynamic programming, temporal difference learning, active reinforcement learning- Q learning.

**REFERENCE BOOK**

1. Stuart Russell and Peter Norvig, “Artificial Intelligence: A Modern Approach” , 3rd Edition, Prentice Hall
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw Hill
3. Trivedi, M.C., “A Classical Approach to Artifical Intelligence”, Khanna Publishing House, Delhi
4. Saroj Kaushik, “Artificial Intelligence”, Cengage Learning India, 2011
5. David Poole and Alan Mackworth, “Artificial Intelligence: Foundations for Computational Agents”, Cambridge University Press 2010