**Title of Subject : Agent Based Intelligent Systems (SW-318)**

**Discipline :** Software Engineering (5th Semester)

**Effective :** 17 Batch & onwards

**Pre-requisite :** None

**Assessment :** Theory**:** 20% Sessional, 80% Written Semester Examination

## (20% Mid, 60% Final)

**Credit Hours :** 03 + 0 **Marks:** 100

 **Minimum Contact Hours:** 45

# Specific Objectives of course:

* The course will be an investigation of the most important developments of AI in multi-agent contexts, focusing on Logic(reasoning), Game-Theory, significant algorithms and applications.

**COURSE LEARNING OUTCOMES:**

Upon successful completion of the course, the student will be able to:

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| **CLOs** | **Description** | **Taxonomy level** | **PLO** |
| 1 | Understand basic principles of Agent based Intelligent Systems, related theory and terminology. | C2 | 1 |
| 2 | Learn the techniques to design agent-based system. | C3 | 3 |
| 3 | To understand and analyze NLP and NLP based techniques | C4 | 2 |

**PROGRAM LEARNING OUTCOMES (PLOs):**

The course is designed so that students will achieve the following PLOs:

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| --- | --- | --- | --- | --- | --- |
| 1 | Engineering Knowledge: | ☑ | 7 | Environment and Sustainability:  | ☐ |
| 2 | Problem Analysis: | ☑ | 8 | Ethics: | ☐ |
| 3 | Design/Development of Solutions: | ☑ | 9 | Individual and Team Work: | ☐ |
| 4 | Investigation: | ☐ | 10 | Communication: | ☐ |
| 5 | Modern Tool Usage: | ☐ | 11 | Project Management: | ☐ |
| 6 | The Engineer and Society: | ☐ | 12 | Lifelong Learning: | ☐ |

**Course outline:**

**INTRODUCTION**

Agent based modelling Definitions, Agents, concept of Rationality, Structure and Types of Agents, intelligent Agents, Environment types & properties.

**INTELLIGENT AGENT SYSTEMS**

Problem Solving, Searching - Heuristics -Constraint Satisfaction Problems - Game playing.

**NATURAL LANGUAGE PROCESSING**

NLP basic, NLP applications and research areas, NLG, NLU, NLP problems and possible solutions, Analysis levels in NLP, NLP system and algorithms.

**AGENTS AND UNCERTAINITY**

Acting under uncertainty – Probability Notation-Bayes Rule and use - Bayesian Networks-Other Approaches-Time and Uncertainty-Temporal Models- Utility Theory - Decision Network – Complex Decisions.

**INTELLIGENT AGENTS & NEURAL NETWORKS**

Artificial Neural Networks, Characteristics of ANN, Topologies of ANN, Basic Learning Laws of

# Recommended Books:

1. Russell S.; Norvig P.; “Artificial intelligence – A Modern Approach”, Latest Edition, Prentice Hall.
2. Michael Wooldridge, "An Introduction to Multi Agent System", John Wiley Latest Edition.
3. Coppin B.; “Artificial Intelligence Illuminated”, Latest Edition, Jones and Bartlett Publishers USA.

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| **Approval:** |  |
| **Board of Studies:** | **Resolution No. 02** | **Dated: 29-08-2019** |
| **Board of Faculty:** | **Resolution No. 01** | **Dated: 07-10-2019** |
| **Academic Council:** | **Resolution No. 96.10** | **Dated: 07-10-2019** |