**Detailed Syllabus**

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| **Subject Code** | 15B11CI514 | **Semester:**  **(specify Odd/Even)** | **Semester** ODD **Session** 2018-2019  **Month from** June 18 **to** Dec 18 |
| **Subject Name** | ARTIFICIAL INTELLIGENCE | | |
| **Credits** | 4 | **Contact Hours** | 3+1 |

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| **Faculty (Names)** | **Coordinator(s)** | Ambalika Sarkar/ Dr. Parul |
| **Teacher(s) (Alphabetically)** | Ambalika Sarkar ,Ms. Dhanlakshmi, Dr. GaganmeetKaur, Dr. Parul , Pawan Upadhay, Dr. Satish Chandra, |

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| **COURSE OUTCOMES** | | **COGNITIVE LEVELS** |
| **C312.1** | Design, implement and analyze the problem solving agents using various informed, uninformed search strategies. | Analyzing [Level 4] |
| **C312.2** | Analyze and apply algorithms to solve problems requiring evolutionary search strategies, constraint satisfaction and game theory. | Analyzing [Level 4] |
| **C312.3** | Represent knowledge and Apply inference mechanisms using propositional logic (PL) and first order predicate logic (FOPL). | Apply [Level 3] |
| **C312.4** | Apply model of probabilistic reasoning in incomplete and uncertain environment. | Apply [Level 3] |
| **C312.5** | Develop the agents with natural language processing and learning capabilities. | Apply [Level 3] |

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| **Module No.** | **Subtitle of the Module** | **Topics in the module** | **No. of Lectures for the module** |
| **1.** | Introduction | History and foundations of AI | 01 |
| **2.** | Problem solving and intelligent agents | PEAS, Structure of agents, nature of environments, concept of rationality | 03 |
| **3.** | Problem solving-I | Problem solving agents, Uninformed search strategies (BFS, UCS, DFS, DLS, IDS) | 04 |
| **4.** | Problem solving-II | Informed Search and Exploration (GBFS, Heuristic function, A\*, RBFS, Hill climbing, Genetic Algorithms) | 06 |
| **5.** | Problem solving-III | Constraint satisfaction problems (backtracking search), Adversarial Search (optimal decision in games, alpha beta pruning) | 05 |
| **6.** | Propositional Logic | Knowledge based agents, Propositional Logic, First order Logic, Syntax and Semantics), Inference in FOPL (Unification, forward and backward chaining, resolution) | 05 |
| **7.** | Knowledge representation | Ontology, actions, situations and events, time and event calculus, mental events, | 03 |
| **8.** | Uncertainty | Inference using full joint distribution, Probabilistic reasoning, Bayesian rule, Bayesian network, Maximum likelihood estimation | 04 |
| **9.** | Learning | decision tree, ensemble learning, K- Nearest Neighbor, K-Means algo, Reinforcement Learning | 07 |
| **10.** | Natural Language Processing | Preprocessing, POS tagging using MLE, Parsing using CYK | 04 |
| **Total number of Lectures** | | | **42** |
| **Evaluation Criteria**  **Components Maximum Marks**  T1 20  T2 20  End Semester Examination 35  TA 25  **Total 100** | | | |

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| **Recommended Reading material:** Author(s), Title, Edition, Publisher, Year of Publication etc. ( Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format) | |
| **1.** | Artificial Intelligence – A modern approach by Stuart Russel and Peter Norvig, PHI, 2008. |
| **2.** | [Artificial Intelligence: foundations of computational agents, Cambridge University Press, 2017](http://artint.info) |
| **3.** | Artificial Intelligence Review: An International Science and Engineering Journal, Springer |
| **4.** | Minds and Machines: Journal for Artificial Intelligence, Philosophy and Cognitive Science, Springer |
| **5.** | IEEE Intelligent Systems |