

| ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (Effective from the academic year 2018 -2019) SEMESTER – VII | | | |
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| Course Code | 18CS71 | CIE Marks | 40 |
| Number of Contact Hours/Week | 4:0:0 | SEE Marks | 60 |
| Total Number of Contact Hours | 50 | Exam Hours | 03 |
| CREDITS –4 | | | |
| Course Learning Objectives: This course (18CS71) will enable students to: <ul style="list-style-type: none"> • Explain Artificial Intelligence and Machine Learning • Illustrate AI and ML algorithm and their use in appropriate applications | | | |
| Module 1 | | | Contact Hours |
| What is artificial intelligence?, Problems, problem spaces and search, Heuristic search techniques Textbook 1: Chapter 1, 2 and 3 RBT: L1, L2 | | | 10 |
| Module 2 | | | |
| Knowledge representation issues, Predicate logic, Representaiton knowledge using rules. Concpet Learning: Concept learning task, Concpet learning as search, Find-S algorithm, Candidate Elimination Algorithm, Inductive bias of Candidate Elimination Algorithm. Textbook 1: Chapter 4, 5 and 6 Textbook2: Chapter 2 (2.1-2.5, 2.7) RBT: L1, L2, L3 | | | 10 |
| Module 3 | | | |
| Decision Tree Learning: Introduction, Decision tree representation, Appropriate problems, ID3 algorith. Aritificil Nueral Network: Introduction, NN representation, Appropriate problems, Perceptrons, Backpropagation algorithm. Textbook2: Chapter 3 (3.1-3.4), Chapter 4 (4.1-4.5) RBT: L1, L2, L3 | | | 10 |
| Module 4 | | | |
| Bayesian Learning: Introduction, Bayes theorem, Bayes theorem and concept learning, ML and LS error hypothesis, ML for predicting, MDL principle, Bates optimal classifier, Gibbs algorithm, Navie Bayes classifier, BBN, EM Algorithm Textbook2: Chapter 6 RBT: L1, L2, L3 | | | 10 |
| Module 5 | | | |
| Instance-Base Learning: Introduction, k-Nearest Neighbour Learning, Locally weighted regression, Radial basis function, Case-Based reasoning. Reinforcement Learning: Introduction, The learning task, Q-Learning. Textbook 1: Chapter 8 (8.1-8.5), Chapter 13 (13.1 – 13.3) RBT: L1, L2, L3 | | | 10 |
| Course Outcomes: The student will be able to : <ul style="list-style-type: none"> • Appaise the theory of Artificial intelligence and Machine Learning. • Illustrate the working of AI and ML Algorithms. • Demonstrate the applications of AI and ML. | | | |
| Question Paper Pattern: | | | |
| <ul style="list-style-type: none"> • The question paper will have ten questions. • Each full Question consisting of 20 marks | | | |

- There will be 2 full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer 5 full questions, selecting one full question from each module.

Textbooks:

1. Tom M Mitchell, "**Machine Learning**", 1st Edition, McGraw Hill Education, 2017.
2. Elaine Rich, Kevin K and S B Nair, "**Artificial Intelligence**", 3rd Edition, McGraw Hill Education, 2017.

Reference Books:

1. Saroj Kaushik, Artificial Intelligence, Cengage learning
2. Stuart Russell, Peter Norving , Artificial Intelligence: A Modern Approach, Pearson Education 2nd Edition
3. Aurélien Geron, "Hands-On Machine Learning with Scikit-Learn and Tensor Flow: Concepts, Tools, and Techniques to Build Intelligent Systems", 1st Edition, Shroff/O'Reilly Media, 2017.
4. Trevor Hastie, Robert Tibshirani, Jerome Friedman, h The Elements of Statistical Learning, 2nd edition, springer series in statistics.
5. Ethem Alpaydın, Introduction to machine learning, second edition, MIT press
6. Srinivasa K G and Shreedhar, " Artificial Intelligence and Machine Learning", Cengage