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| **ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**  **(Effective from the academic year 2018 -2019) SEMESTER – VII** | | | | |
| **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: | | | | |
| * 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  **Texbook 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.  **Texbook 1: Chapter 4, 5 and 6**  **Texbook2: 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.  **Texbook2: 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  **Texbook2: 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.  **Texbook 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 : | | | | |
| * 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:** | | | | |
| * The question paper will have ten questions. * Each full Question consisting of 20 marks | | | | |

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| * 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 Lerning”,**1st Edition, McGraw Hill Education, 2017. 2. Elaine Rich, Kevin K and S B Nair, **“Artificial Inteligence”,** 3rd Edition, McGraw Hill Education, 2017. |
| **Reference Books:** |
| 1. Saroj Kaushik, Artificial Intelligence, Cengage learning 2. Stuart Rusell, Peter Norving , Artificial Intelligence: A Modern Approach, Pearson Education 2nd Edition 3. AurÈlienGÈron,"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. Srinvivasa K G and Shreedhar, “ Artificial Intelligence and Machine Learning”, Cengage |