B.TECH. IV Semester-7	L	T	P	C
CS 701: Artificial Intelligence	3	0	2	4

Unit - 1	6 Hours
Introduction to AI: Foundation of AI, AI Applications, Agent & environment, Rationality, Types of Agents, AI Techniques, AI-Problem formulation Basics of problem- solving: Problem representation paradigms, Defining the Problems as a State Space Search, state space, satisfiability vs optimality, pattern classification problems, example domains.	
Unit - 2	**14 Hours**
Problem solving through search: Problem size, complexity, approximation and search, Measure of Performance and Analysis of Search Algorithms. Search techniques: uninformed search – DFS, BFS, Iterative deepening depth-first search; informed search – Heuristic Search Techniques, Best-first search(greedy), A*, IDA*, Local search, Hill Climbing & its variants, Simulated Annealing, Problem Reduction search: AND-OR graphs - AO* and game trees – Game playing, Adversarial Search, Minimax, Alpha-Beta pruning, Constraint Satisfaction problems, Means-Ends Analysis, knowledge based problem solving. Introduction to Neural Network.	
Unit - 3	**14 Hours**
Knowledge Representation & Acquisition: Knowledge representation as logic, Propositional logic, Predicate (First order) logic; Inference, rule based, frame and semantic network approaches, Knowledge Acquisition: Learn ability theory, approaches to learning. *Uncertainty*: Uncertainty Treatment: formal and empirical approaches including Bayesian theory, belief functions, certainty factors, and fuzzy sets. Detailed Discussion from Example Domains: Industry, Language, Medicine, Verification, Vision, Knowledge Based Systems.	
Unit - 4	**8 Hours**
Planning & Expert Systems: The Blocks World, Components Of A Planning System, Goal Stack Planning, Nonlinear Planning Using Constraint Posting, Hierarchical Planning, Reactive Systems, Languages and Machines : AI languages and systems, special purpose architectures, expert systems: Architecture of Expert Systems, Roles of Expert Systems – Knowledge Acquisition – Meta Knowledge, Heuristics, Case studies (MYCIN, DART).	
Total Contact Time: 42 Hours	

Recommended Books

1. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Prentice-Hall, Pearson Education
2. Nils J. Nilsson, Artificial Intelligence: A New Sythesis, Morgan-Kaufmann.
3. Artificial Intelligence: Elaine Rich And Kevin Knight, Tata Mcgraw-Hill
4. E. Charniack and D. McDermott, Artificial Intelligence, Addison Wesley
5. Winston P.H., Artificial Intelligence, 3rd edition, Addison Wesley

Useful Links

1. AI on the Web
2. http://www.aaai.org

B.TECH. IV Semester-7	L	T	P	C
EC 702: Electric Vehicle Technology	3	0	0	3

Unit - 1	10 Hours
Introduction to Electric Vehicles(EV) : Battery Electric Vehicles; The IC Engine/Electric Hybrid Vehicle; Fuelled Electric Vehicles; Electric Vehicles using Supply Lines; Support Systems; Efficiency and Pollution Aspects.	
Unit - 2	**10 Hours**
Basics of Vehicle dynamics: Power Train Components of EV System; Dynamic Axle Loads; Aerodynamics; Acceleration and braking Performance; Force – Velocity Profiles; Approach to EV Modelling.	
Unit - 3	**10 Hours**
Battery Energy Storage: Types of Traction Batteries; Basics and Parameters; Battery Charging, Discharging and State of Charge; Circuit Modeling of Batteries; Safety Issues; Future Trends on Battery Management Systems; Alternative Energy Sources.	
Unit - 4	**12 Hours**
Electrical Machines and Controllers: Choice of Motors; Torque-Speed Characteristics of the Motor and Load; Motor Cooling, Efficiency, Size, Mass and Rating. Power Electronic Converters for drives. Energy recovery through regenerative Braking; Safety and Performance Monitoring. Ancillary Systems: Battery Charging Stations; Data Acquisition, Safety and Performance Monitoring Systems; Vehicle Supervisory Control and Communication Systems.	
Total Contact Time: 42 Hours	

Recommended Books

1. Electric Powertrain – Energy Systems, Power electronics and drives for Hybrid, electric and fuel cell vehicles by john G Hayes and A. Goodarzi, Wiley Publication.
2. Electric and Hybrid Vehicles: Design Fundamentals by Iqbal Hussein, CRC Press
3. Modern Electric, Hybrid Electric and Fuel Cell Vehicles: Fundamentals, Theory and Design, By Mehrdad Ehsani, Yimi Gao, Sebastian E. Gay, Ali Emadi, CRC Press
4. Electric Vehicle Technology Explained, James Larminie, John Lowry, Wiley, 2003
5. Electric Powertrain Energy Systems, Power Electronics and Drives for Hybrid, Electric and Fuel Cell Vehicles by John G. Hayes,G. Abas Goodarzi, Wiley
6. Permanent Magnet Synchronous and Brushless DC Motor Drives by R. Krishnan, CRC Press
7. Electric and Hybrid Vehicles Technologies, Modeling and Control: A Mechatronic Approach by Amir Khajepour, Saber Fallah, AvestaGoodarzi, Wiley
8. Fundamentals of Vehicle Dynamics by Thomas D. Gillespie
9. Frank R. Spellman, The Science of Electric Vehicles-Concepts and Applications, CRC Press (2023).