RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Mechanical Engineering, VII-Semester

Open Elective ME- 703(B) Artificial Intelligence Techniques

Course Objectives
After studing this course, students will be able to
1. learn about importance of AI techniques. Adoption of Artificial Intelligence (AI) technologies is widely expanding in our society. Applications of AI include: self-driving cars, personal assistants, surveillance systems, robotic manufacturing, machine translation, financial services, cyber security, web search, video games, code analysis and product recommendations.

2. Know the exact application of AI Techniques. Such applications use AI techniques to interpret information from a wide variety of sources and use it to enable intelligent, goal-directed behavior.

3. understand the working of Modern AI based systems. It often involves self-learning systems that are trained on massive amounts of data, and/or interacting intelligent agents that perform distributed reasoning and computation.

4. Know about sensors used in AI based systems.AI connects sensors with algorithms and human-computer interfaces, and extends itself into large networks of smart devices.

5. know the opportunities after having knowledge of AI techniques. The knowledge of Artificial Intelligence opens career opportunities in companies that are building the next generation of intelligence and language understanding for their products: for example intelligent personal assistants, opinion mining systems, customer support system, biomedical applications, computer games, smart adaptive devices, robots, smart planning systems.

Syllabus
Unit 1: Introduction to Artificial Intelligence
 Main components and characteristics of AI (Feature Engineering,ANN,Deep Learning),Applications of AI, Advantages and disadvantages of AI, Goals of AI, Comparision of Programming of a System with AI and without AI,Challenges in AI, Programming languges preferably used in AI,Techniques/Algorithms used in AI,AI Software plaforms,Future of AI

Unit 2: Various types of production systems and search techniques: Types of production systems,Characteristics of production systems, Study and comparison of breadth first search and depth first search. Techniques, other Search Techniques like hill Climbing, Best first Search. A* algorithm, AO* algorithms etc, and various types of control strategies.

Unit 3: Knowledge Representation and Probabilistic Reasoning: Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and nonmonotonic reasoning. Probabilistic reasoning, Baye's theorem, semantic networks, scripts, schemas, frames, conceptual dependency, fuzzy logic, forward and backward reasoning.

Unit 4: Game playing techniques: Minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing.

Unit 5: Introduction to learning ,ANN: Various techniques used in learning, introduction to Artificial neural networks, common sense, reasoning, Convolution Neural Network,Feedforward Neural Network, Recurrent Neural Network, Multilayer perceptron, Architecture / Three Layers in Artificial Neural Networks, Implementation of ANN, Applications of ANN in images,signals and languagesome example of expert systems.

References:-
1.**Rich E and Knight K, "Artificial Intelligence", TMH, New Delhi.
2.**Nelsson N.J., "Principles of Artificial Intelligence", Springer Verlag, Berlin.
3. Stuart Russell , Artificial Intelligence: A Modern Approach , 3rd Edition), Peter Norvig, PHI, ISBN-13: 978-0136042594, ISBN-10: 0136042597
4. B. Yegnanarayana , Artificial Neural Networks   ,PHI
5.Schalkoff, Artificial Neural Networks . Mc Graw HILL Education

Evaluation:
Evaluation will be continuous and integral part of the class as well as through external assessment