

ARTIFICIAL INTELLIGENCE

21AM503

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NMAMIT

ARTIFICIAL INTELLIGENCE

Credits – 3

Course Code	21AM503
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CIE Marks.	50
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Number of Contact Hours/Week.	3:0:0
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SEE Marks.	50
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Total Number of Contact Hours.	39
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Exam Hours.	03
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Evaluation

Internal

Tasks : 3 - 10 marks, MSE : 2 - 40 marks

Assignment 1 - Unit I - 5 Marks

Assignment 2 - Unit II - 3 marks

Quiz - Unit III - 2 marks

MSE 1 - 20 marks

MSE 2 - 20 marks

Total - 50 marks

Course Learning Objectives

At the end of the course student will be able to:

Understanding **history of Artificial Intelligence (AI)** and its foundation.

Learn **basic principles of AI** in solutions that require problem solving, inference, perception, knowledge representation and learning

Analyze **various applications of AI techniques** in intelligent agents, expert systems, artificial neural networks and other **machine learning models**.

Identify and explain the proficiency **developing applications** of AI language, expert system shell, or data mining tool.

Determine an ability to share in discussions of AI, its **current scope and limitations**.

Syllabus

Unit I

Contact Hours : 10

Introduction: what is AI, Acting Humanly: The Turing Test approach, Thinking Humanly: The cognitive modelling approach, Thinking rationally: The laws of thought approach, Acting Rationally: The rational agent approach. The state of art

Intelligent Agents: Agents and Environments, Good behaviour: The concept of rationality, The nature of environments, properties of task environments, Structure of Agents: Agent Programs, Types of agent programs

Solving Problems by Searching: Problem solving Agents, well defined problems and solutions, formulating problems, Example problems: Toy problems: Vacuum world, 8-Queen's problem, Real world problem: Airline Route finding problem

Syllabus..

Unit II

Contact Hours : 12

Searching for solutions: Infrastructure for search algorithms, measuring problem solving performance, Uninformed search strategies: Breadth first search, Cost search, Depth first search, Informed search strategies: Greedy best search, A* algorithms, Heuristic functions

Quantifying Uncertainty: Acting under uncertainty, summarizing uncertainty, Uncertainty and rational decisions, Basic probability notation, what probabilities are about. The language of propositions in probability assertions, Inference using full joint distribution, Bayes' rule and its use, Applying Bayes' rule for simple use case

Probability Reasoning Over time: Time and Uncertainty, States and observations, Transition and Sensor models, Inference in temporal models, Smoothing, Hidden Markov model, Simplified matrix algorithms, Hidden Markov model: Localization, Kalman Filter basics.

Syllabus..

Unit III

Contact Hours : 10

Reinforcement Learning: Introduction, Passive reinforcement learning, Generalization in reinforcement learning, Applications of reinforcement learning,

Q-Learning Intuition: Plan of attack, Bellman Equation, The Plan, Markov Decision Process, Policy vs Plan, Adding Living penalty, Temporal Difference

Course Outcomes

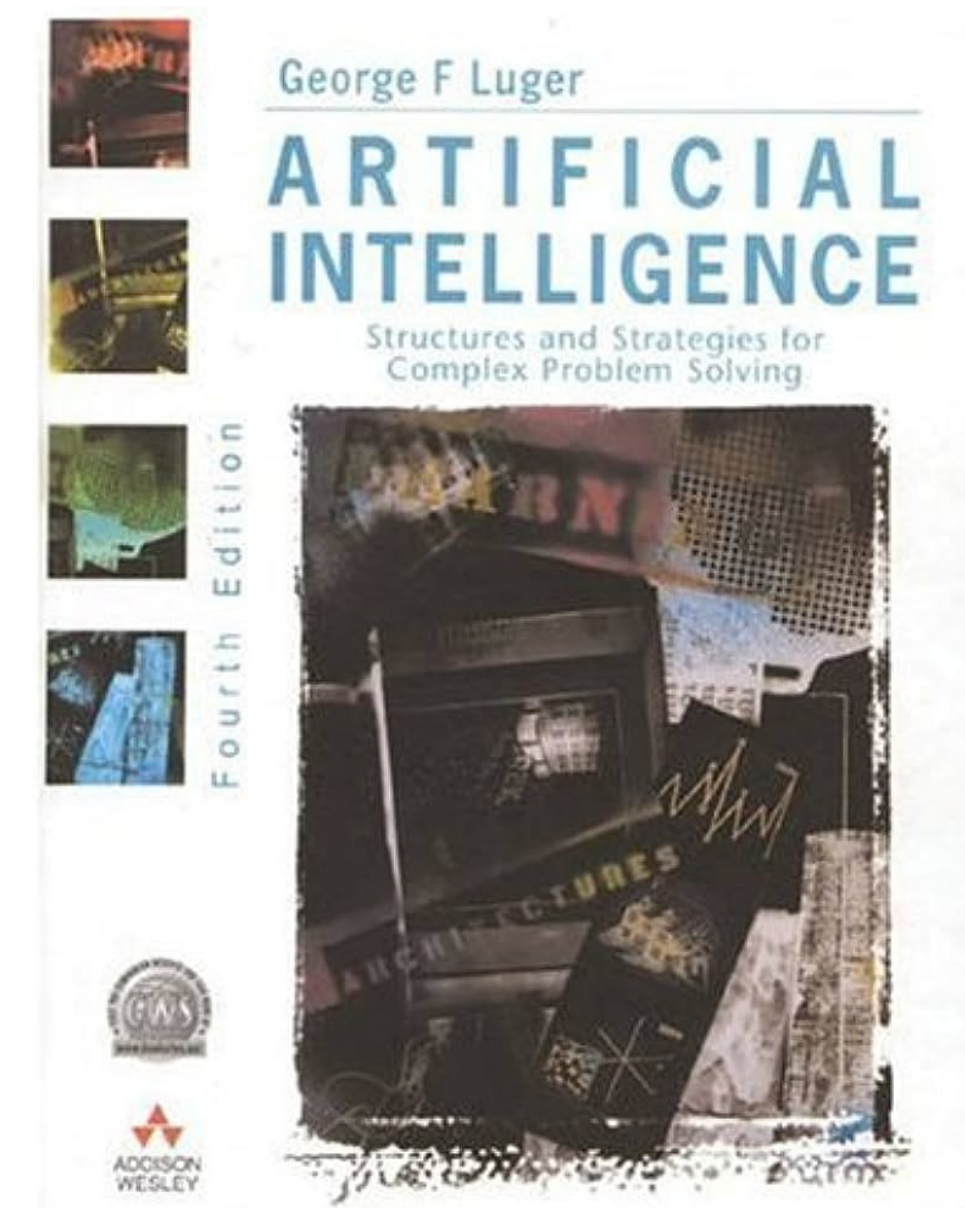
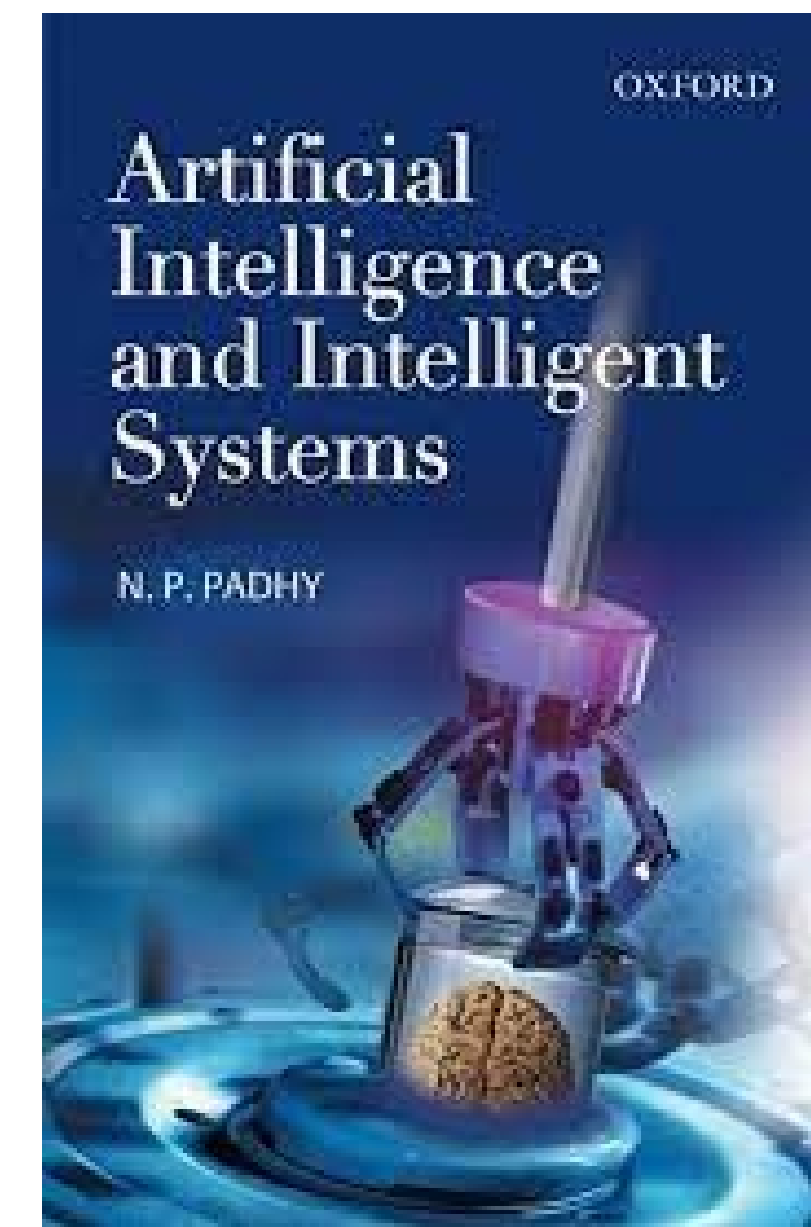
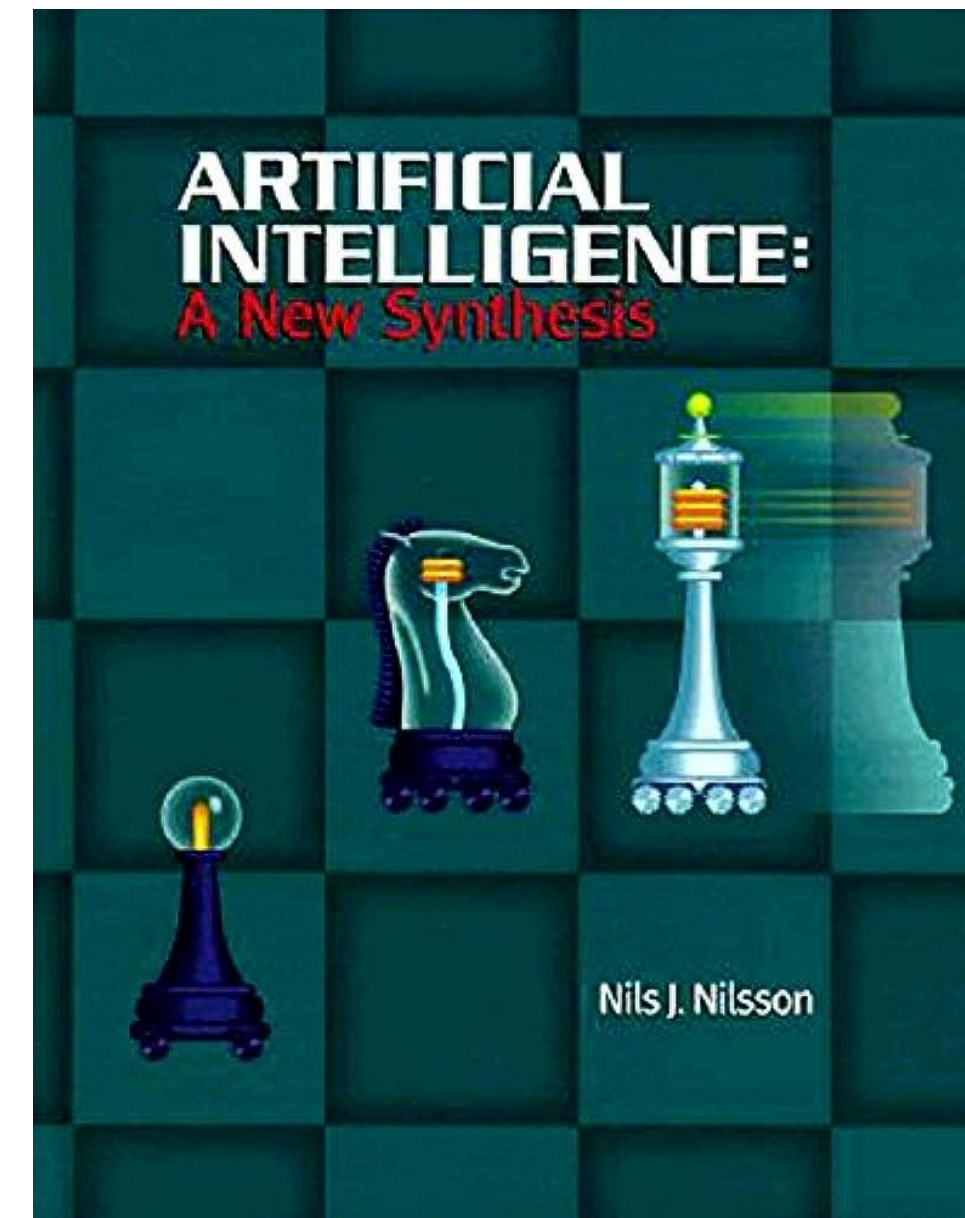
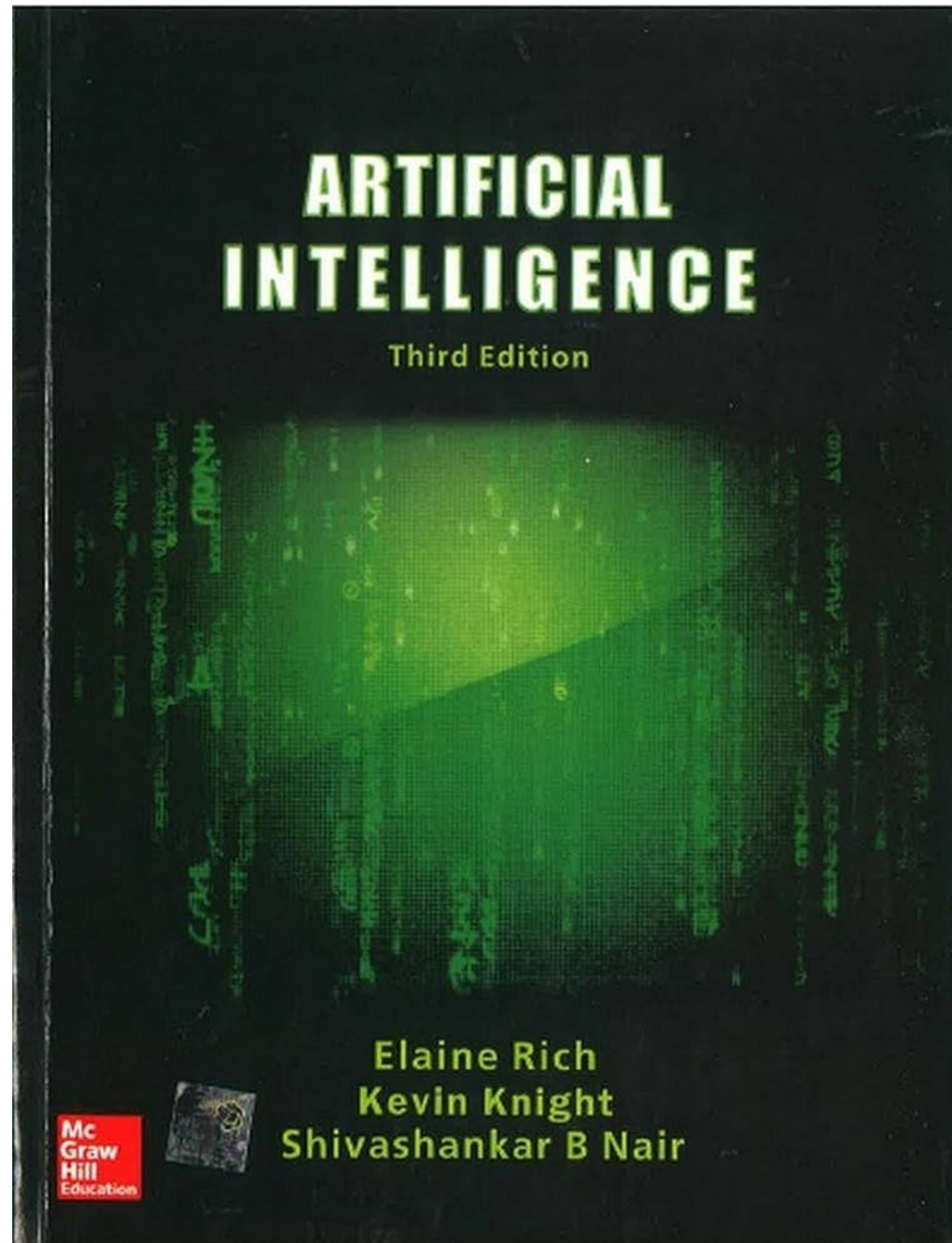
At the end of the course student will be able to:

1. Explain the fundamental understanding of the **history** of Artificial Intelligence (AI) and its foundation.
2. Interpret the **basic principles of AI** in solutions that require problem solving, inference, perception, knowledge representation and learning
3. Describe the awareness and fundamental understanding of **various applications of AI** techniques in intelligent agents, expert systems, artificial neural networks and other **machine learning models.**
4. Identify and explain the proficiency **developing applications** of AI language, expert system shell, or data mining tool
5. Determine an ability to share in discussions of AI, its current **scope and limitations.**

Reference Books:

1. Artificial Intelligence by Rich and Knight, The McGraw Hill, 2017
2. Artificial Intelligence: A new synthesis by Nils and Nilson, Elsevier, 1997.
3. Artificial Intelligence by Luger, Pearson Education, 2002.
4. Artificial Intelligence by Padhy, Oxford Press, 2005.

Text book



Introduction

