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3. Expert Instructor-Led Training
4. ADA Compliant & JAWS Compatible Platform
5. State of the Art Educator Tools
6. Award Winning Learning Platform (LMS)
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Videos and How To

1. Course Objective

Artificial intelligence: A modern approach course explores the full breadth and depth of artificial intelligence technology. The comprehensive course helps in understanding the topics such as machine learning, deep learning, transfer learning, multiagent systems, robotics, natural language processing, causality, probabilistic programming, privacy, fairness, and safe AI. The artificial intelligence course provides students with a basic understanding of the frontiers of AI without compromising complexity and depth and also shows students how the various subfields of AI fit together to build actual, useful programs.

2. flashcards

Flashcards are effective memory-aiding tools that help you learn complex topics easily. The flashcard will help you in memorizing definitions, terminologies, key concepts, and more. There is no limit to the number of times learners can attempt these. Flashcards help master the key concepts.

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3. Glossary of terms

uCertify provides detailed explanations of concepts relevant to the course through Glossary. It contains a list of frequently used terminologies along with its detailed explanation. Glossary defines the key terms.



4. **Expert Instructor-Led Training**

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

5. **ADA Compliant & JAWS Compatible Platform**

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

6. State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

7. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

- **2014**

1. Best Postsecondary Learning Solution

- **2015**

1. Best Education Solution
2. Best Virtual Learning Solution
3. Best Student Assessment Solution
4. Best Postsecondary Learning Solution
5. Best Career and Workforce Readiness Solution
6. Best Instructional Solution in Other Curriculum Areas
7. Best Corporate Learning/Workforce Development Solution

- **2016**

1. Best Virtual Learning Solution
2. Best Education Cloud-based Solution
3. Best College and Career Readiness Solution
4. Best Corporate / Workforce Learning Solution
5. Best Postsecondary Learning Content Solution

6. Best Postsecondary LMS or Learning Platform
7. Best Learning Relationship Management Solution

- **2017**

1. Best Overall Education Solution
2. Best Student Assessment Solution
3. Best Corporate/Workforce Learning Solution
4. Best Higher Education LMS or Learning Platform

- **2018**

1. Best Higher Education LMS or Learning Platform
2. Best Instructional Solution in Other Curriculum Areas
3. Best Learning Relationship Management Solution

- **2019**

1. Best Virtual Learning Solution
2. Best Content Authoring Development or Curation Solution
3. Best Higher Education Learning Management Solution (LMS)

- **2020**

1. Best College and Career Readiness Solution
2. Best Cross-Curricular Solution
3. Best Virtual Learning Solution

8. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

Syllabus

Chapter 1: Introduction

- What Is AI?
- The Foundations of Artificial Intelligence
- The History of Artificial Intelligence
- The State of the Art
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 2: Intelligent Agents

- Agents and Environments
- Good Behavior: The Concept of Rationality
- The Nature of Environments
- The Structure of Agents
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 3: Solving Problems by Searching

- Problem-Solving Agents
- Example Problems

- Searching for Solutions
- Uninformed Search Strategies
- Informed (Heuristic) Search Strategies
- Heuristic Functions
- Finding Relevant Code
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 4: Beyond Classical Search

- Local Search Algorithms and Optimization Problems
- Local Search in Continuous Spaces
- Searching with Nondeterministic Actions
- Searching with Partial Observations
- Online Search Agents and Unknown Environments
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 5: Adversarial Search

- Games
- Optimal Decisions in Games
- Alpha–Beta Pruning

- Imperfect Real-Time Decisions
- Stochastic Games
- Partially Observable Games
- State-of-the-Art Game Programs
- Alternative Approaches
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 6: Constraint Satisfaction Problems

- Defining Constraint Satisfaction Problems
- Constraint Propagation: Inference in CSPs
- Backtracking Search for CSPs
- Local Search for CSPs
- The Structure of Problems
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 7: Logical Agents

- Knowledge-Based Agents
- The Wumpus World
- Logic

- Propositional Logic: A Very Simple Logic
- Propositional Theorem Proving
- Effective Propositional Model Checking
- Agents Based on Propositional Logic
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 8: First-Order Logic

- Representation Revisited
- Syntax and Semantics of First-Order Logic
- Using First-Order Logic
- Knowledge Engineering in First-Order Logic
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 9: Inference in First-Order Logic

- Propositional vs. First-Order Inference
- Unification and Lifting
- Forward Chaining
- Backward Chaining
- Resolution

- Summary, Bibliographical and Historical Notes, Exercises

Chapter 10: Classical Planning (Supplemental)

- Definition of Classical Planning
- Algorithms for Planning as State-Space Search
- Planning Graphs
- Other Classical Planning Approaches
- Analysis of Planning Approaches
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 11: Planning and Acting in the Real World

- Time, Schedules, and Resources
- Hierarchical Planning
- Planning and Acting in Nondeterministic Domains
- Multiagent Planning
- Summary, Bibliographical and Historical Notes, and Exercise

Chapter 12: Knowledge Representation

- Ontological Engineering
- Categories and Objects

- Events
- Mental Events and Mental Objects
- Reasoning Systems for Categories
- Reasoning with Default Information
- The Internet Shopping World
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 13: Quantifying Uncertainty

- Acting under Uncertainty
- Basic Probability Notation
- Inference Using Full Joint Distributions
- Independence
- Bayes' Rule and Its Use
- The Wumpus World Revisited
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 14: Probabilistic Reasoning

- Representing Knowledge in an Uncertain Domain
- The Semantics of Bayesian Networks

- Efficient Representation of Conditional Distributions
- Exact Inference in Bayesian Networks
- Approximate Inference in Bayesian Networks
- Relational and First-Order Probability Models
- Other Approaches to Uncertain Reasoning
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 15: Probabilistic Reasoning over Time (Supplemental)

- Time and Uncertainty
- Inference in Temporal Models
- Hidden Markov Models
- Kalman Filters
- Dynamic Bayesian Networks
- Keeping Track of Many Objects
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 16: Making Simple Decisions (Supplemental)

- Combining Beliefs and Desires under Uncertainty
- The Basis of Utility Theory

- Utility Functions
- Multiattribute Utility Functions
- Decision Networks
- The Value of Information
- Decision-Theoretic Expert Systems
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 17: Making Complex Decisions (Supplemental)

- Sequential Decision Problems
- Value Iteration
- Policy Iteration
- Partially Observable MDPs
- Decisions with Multiple Agents: Game Theory
- Mechanism Design
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 18: Learning from Examples

- Forms of Learning
- Supervised Learning

- Learning Decision Trees
- Evaluating and Choosing the Best Hypothesis
- The Theory of Learning
- Regression and Classification with Linear Models
- Artificial Neural Networks
- Nonparametric Models
- Support Vector Machines
- Ensemble Learning
- Practical Machine Learning
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 19: Knowledge in Learning

- A Logical Formulation of Learning
- Knowledge in Learning
- Explanation-Based Learning
- Learning Using Relevance Information
- Inductive Logic Programming
- Feature Space Engineering

- Data Preparation and Preprocessing
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 20: Learning Probabilistic Models

- Statistical Learning
- Learning with Complete Data
- Learning with Hidden Variables: The EM Algorithm
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 21: Reinforcement Learning

- Introduction
- Passive Reinforcement Learning
- Active Reinforcement Learning
- Generalization in Reinforcement Learning
- Policy Search
- Applications of Reinforcement Learning
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 22: Natural Language Processing (Supplemental)

- Language Models

- Text Classification
- Information Retrieval
- Information Extraction
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 23: Natural Language for Communication (Supplemental)

- Phrase Structure Grammars
- Syntactic Analysis (Parsing)
- Augmented Grammars and Semantic Interpretation
- Machine Translation
- Speech Recognition
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 24: Perception (Supplemental)

- Image Formation
- Early Image-Processing Operations
- Object Recognition by Appearance
- Reconstructing the 3D World
- Object Recognition from Structural Information

- Using Vision
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 25: Robotics

- Introduction
- Robot Hardware
- Robotic Perception
- Planning to Move
- Planning Uncertain Movements
- Moving
- Robotic Software Architectures
- Application Domains
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 26: Focus: Robotics and Feature Engineering

- Coppelia Robotics
- Robotics: Feature Engineering

Chapter 27: Philosophical Foundations

- Weak AI: Can Machines Act Intelligently?
- Strong AI: Can Machines Really Think?
- The Ethics and Risks of Developing Artificial Intelligence
- Summary, Bibliographical and Historical Notes, Exercises

Chapter 28: AI: The Present and Future

- Agent Components
- Agent Architectures
- Are We Going in the Right Direction?
- What If AI Does Succeed?

Chapter 29: Appendix A: Mathematical background

- A.1 Complexity Analysis and $O()$ Notation
- A.2. Vectors, Matrices, and Linear Algebra
- A.3 Probability Distributions

Chapter 30: Appendix B: Notes on Languages and Algorithms

- B.1 Defining Languages with Backus–Naur Form (BNF)
- B.2 Describing Algorithms with Pseudocode

You can't stay away! Get



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