Cisco Networking Academy

Introduction to Modern AI

Course Overview

This interactive course covers the basics of AI through free AI-enabled apps. Topics include the basics of computer vision, machine translation, and chatbots. Students learn how chatbots work, gain tips for writing better prompts, and explore ways to apply chatbots for personal use and productivity.

Benefits

AI-enabled apps are revolutionizing the way we work and learn, with millions worldwide using them to simplify everyday tasks. Teaching students practical AI skills can foster innovation and enhance their future AI readiness.

- ✓ Write effective chatbot prompts.
- ✓ Teach computer vision with a photo app.
- ✓ Apply machine translation using an online translation tool.
- ✓ Practice 16 prompting exercises, with 10+ popular chatbots and AI tools.
- ✓ Learn how chatbots are used in seven key-ways: *Expand*, *Synthesize*, *Transform*, *Evaluate*, *Chat*, *Take Actions*, and *Input Images and Text*.

Course Details

Target Audience: High School, secondary or vocational school and college/university students and general audience

Estimated Time to Completion: 6 hours

Prerequisites: None

Course Delivery: Self-paced and Instructor-led

Learning Component Highlights:
- 2 learning modules
- 50 lecture videos
- 16 chatbot prompting exercises
- 5 hours of engaging video content
- 1 hands-on, open-ended video project
- 1 final exam

Course Recognitions: Digital badge

Requirements

- ASC Alignment: Recommended
- Instructor Training: Optional
- Physical Equipment: Not Required

Introduction to Modern AI

Scope and Sequence

Version 1.0

Contents

Target Audience

The Cisco Networking Academy "Introduction to Modern AI" is an introductory course designed to provide students with a foundational understanding of modern artificial intelligence (AI) concepts and applications. This course is suitable for learners with basic computer skills and an interest in exploring the world of AI.

No prior knowledge of AI or machine learning is required, making it accessible to individuals from various backgrounds and skill levels.

The course incorporates hands-on practice with popular AI tools and platforms, empowering learners to apply theoretical knowledge to real-world scenarios.

Individuals seeking to gain a broad understanding of AI, its potential, and its practical uses will benefit from this course.

The course is particularly relevant for those interested in exploring specific AI areas like computer vision, machine translation, and chatbots.

The course offers flexible learning paths, allowing learners with varying levels of familiarity with AI to tailor their experience.

For instance, individuals already familiar with AI and machine learning concepts can skip the introductory lessons and proceed directly to specific areas like computer vision, machine translation, and chatbots.

Prerequisites

The "Introduction to Modern AI" course has no formal prerequisites. It is recommended that learners possess basic computer skills (the ability to use a computer and or smartphone).

Course Description

The Cisco Networking Academy "Introduction to Modern AI" course is a comprehensive online course that introduces participants to the fascinating world of modern Artificial Intelligence. Through a series of video lectures, interactive exercises, and hands-on practice, learners will explore how to use AI for daily tasks, in areas such as computer vision, translation, and natural language processing.

Key features of the course include:

- Flexible Learning Paths: The course offers suggested learning paths tailored to different levels of AI familiarity. Learners new to AI can follow the lectures sequentially, while those with prior experience can focus on specific areas of interest, such as computer vision, machine translation, or chatbots.
- Interactive Exercises: The course integrates interactive elements, such as suggested practice activities, to reinforce learning and encourage practical application of AI concepts.
- Apply to tasks encountered in daily life: Learners will gain insights into real-world applications of AI by exploring examples that they may encounter in personal life or at work.
- Open-Ended Project: The course culminates in an open-ended project, providing learners with the opportunity to apply their acquired knowledge creatively and showcase their understanding of how to use AI to accomplish daily tasks.

- Community Interaction: Learners can join a dedicated Discord group to connect with classmates, share their learning experiences, and engage in discussions related to AI.

Course Objectives

Upon completion of the "Introduction to Modern AI" course, students will be able to:

- Define key AI concepts, such as machine learning, models, and generative vs. non generative AI.
- Explore computer vision techniques: Students will gain practical knowledge of computer vision techniques, such as object detection, similarity search, image segmentation, and optical character recognition.
- Understand machine translation challenges: Students will learn about the challenges of machine translation, particularly concerning word order, context, idiomatic expressions, and the distance between words.
- Use and understand chatbots: Students will gain practical experience in using various chatbots and understand their capabilities and limitations. They will be able to utilize popular chatbots like ChatGPT, Gemini, Claude, and others. They will learn about different chatbot functionalities, including expanding, synthesizing, transforming, evaluating, chatting, and taking actions.
- Apply prompt engineering techniques: Students will learn about effective prompt engineering techniques to improve chatbot performance. They will understand the importance of providing clear instructions, breaking down tasks into sub-tasks, and setting expectations for the chatbot. They will also learn about techniques like few-shot prompting, giving the chatbot a persona, and asking for output in specific formats.
- Recognize chatbot limitations: Students will understand the limitations of chatbots, including issues like hallucinations and memory limitations. They will be able to identify instances where chatbots might provide inaccurate or fabricated information and learn strategies for mitigating these issues.
- Gain awareness of generative AI: Students will learn about generative AI and how it differs from non-generative AI. They will understand the concept of generative AI producing new outputs based on learned patterns, while non-generative AI relies on predefined outputs.
- Understand key vocabulary in AI: Students will gain familiarity with essential vocabulary related to AI, including terms like transformers, foundation models, pre-training, instruction tuning, and GPT.

Equipment Requirements

Any device with Internet access (Smartphones/Tablets/Chromebooks/Laptops/Desktops).

Course Outline

The "Introduction to Modern AI" course is structured into 7 lessons that introduce students to a variety of concepts in modern artificial intelligence. Each lesson is comprised of several sections. Lessons may include a mix of video lectures, suggested practice exercises, extra (optional) resources like links to the online apps used.

Module Title and Objective

Module Title/Topic Title	Objective
Module 1: AI and Machine Learning	**Explain fundamentals AI concepts**
0.1 Intro to the course	Get an overview of AI.
0.2 What you will be able to do	Get an overview of the course.
0.3 Definition of AI	Define artificial intelligence and explain the Turing Test as a measure of machine intelligence.
0.4 What is Intelligence?	Compare tasks to better understand what tasks require more “intelligence”.
0.5 Machine Learning	Define machine learning and explain how it enables computer programs to learn from experience to improve their performance on specific tasks.
0.6 Models	Understand the concept of a model as a function that processes inputs to produce outputs and explain how models use parameters and neural networks to learn and improve.
0.7 The Big picture (optional)	Get some tips for how to study a topic, by first getting an overview of the topic.
Module 1: Computer Vision	**Explain fundamental computer vision concepts and use computer vision in apps.**
1.1.2 Object Detection	Understand the concepts of object localization, image classification, and object detection, and how they relate to one another.
1.2.2 Similarity Search	Understand how embeddings are used to represent and compare images in similarity search.
1.1.33 Image Segmentation	Identify all the pixels associated with a particular object in an image using image segmentation.
1.1.4 Optical Character Recognition	Extract text from images using Optical Character Recognition and understand its limitations.
1.1.5 Take a break	Improve your performance on a task by taking a break, based on the concept of “Incubation Theory”.
Module 1.2: Machine Translation	**Identify challenges with machine translation accuracy, use translation apps and analyzing results.**
1.2.1 Words and Word Order	Differentiate between homonyms and homographs and analyze how word order affects translation accuracy.
1.2.2 Context	Describe the various types of network connectivity, including wired (Ethernet and fiber optics) and wireless (Wi-Fi, Bluetooth, cellular, satellite)
1.2.3 Idiomatic vs literal	Study how certain phrases can be translated either literally or idiomatically depending on the context surrounding that phrase.
1.2.4 Distance Between Two Words	Analyze how the distance between a noun and its pronoun affects translation accuracy, particularly in languages with gendered pronouns.
1.2.5 Think like a detective (optional)	Apply some study tips to enhance your understanding of a tool or concept by interacting with that tool.
Module 1.3: Chatbots Overview	**Explain chatbot design and behavior informs how your prompt and use chatbots. Practice prompting tips that apply to most scenarios.**

Module Title/Topic Title	Objective
1.3.1 What you can do with Chatbots	Understand the capabilities of chatbots and identify various tasks they can perform, such as expanding, synthesizing, transforming, evaluating, chatting, and taking actions.
1.3.2 When it's all connected	Explain the transformative impact of the Internet of Things (IoT) and the importance of addressing its potential drawbacks.
1.3.3 Predict the Next Word	Understand the concept of language modeling and how large language models predict the next word based on previous words.
1.3.4 Hallucinations	Recognize and evaluate the potential for hallucinations in chatbot outputs and verify their factual accuracy.
1.3.5 Memory	Understand how chatbot memory affects responses and how to manage it by starting new chats.
1.3.6 Use Multiple Chatbots	Utilize different chatbots for the same task to compare results and improve accuracy.
1.3.7 Test It Before You Rely on It	Emphasize the importance of testing chatbot outputs before relying on them for critical tasks.
1.3.8 How to Write Your Prompts	Apply effective prompt writing techniques, such as providing clear instructions, breaking down tasks, setting expectations, and using appropriate formatting.
1.3.9 Silver Linings	Learn how certain setbacks can lead to unexpected opportunities.
Module 1.4: Ways to Use Chatbots	**Practice using chatbots for 16 distinct kinds of tasks.**
1.4.1 Expand: Answer Questions	Utilize chatbots to answer questions, ask follow-up questions, and expand on subtopics.
1.4.2 Expand: Generating Ideas	Generate ideas and analyze creative concepts using chatbots, including exploring joke structures.
1.4.3 Synthesize: Summarize	Summarize large amounts of text using chatbots and understand the capabilities of various summarization tools.
1.4.4 Synthesize: Label	Label and categorize information from text using chatbots to extract insights and analyze trends.
1.4.5 Transform: Translate	Translate text into multiple languages using chatbots and compare different translation approaches.
1.4.6 Transform: Reword and Rewrite	Utilize chatbots to reword and rewrite text for clarity, style, and language proficiency.
1.4.7 Evaluate: Fact Check	Fact-check information using chatbots, recognizing the importance of cross-referencing and critical evaluation
1.4.8 Evaluate: Grading	Apply chatbots to assess student work, understanding their limitations and the need for human oversight.
1.4.9 Evaluate: Qualitative Scoring:	Utilize chatbots for qualitative evaluation of open-ended tasks, including debate arguments, understanding the subjectivity of such assessments.
1.4.10 Chat: How's It Going?	Engage in meaningful conversations with chatbots, considering factors such as conversation flow and role-playing.
1.4.11 Chat: Mock Interview	Simulate interview scenarios using chatbots to practice interview skills and receive feedback.
1.4.12 Chat: Chatbot to Chatbot Collaboration	Facilitate collaboration between chatbots for tasks like writing and editing, recognizing the need for human supervision to ensure responsible outcomes.
1.4.13 Take Action: Tools	Integrate chatbots with tools and code to automate tasks and perform complex operations, including data processing and mathematical calculations.
1.4.14 Image Generation	Understand the concept of image generation using diffusion models and explore different image generation tools.

Module Title/Topic Title	Objective
1.4.15 Take Actions: Personal Assistants	Utilize personal assistants on smartphones for various tasks, including scheduling, communication, and navigation.
1.4.16 Multimodal	Prompting with Images and Text: Incorporate images and text in prompts to enhance chatbot understanding and task performance.
Module 1.5: Generative AI and Other Vocabulary Words	**Learn basics of common vocabulary words related to AI and generative AI.**
1.5.1 Generative AI and Other Vocabulary Words part 1	Define key concepts in AI, including generative AI, non-generative AI, transformers, foundation models, pre-training, instruction tuning, GPT.
1.5.2 Generative AI and Other Vocabulary Words part 2	Define key concepts in AI, model compression techniques, GPUs, and Retrieval Augmented Generation (RAG).
1.5.3 Skill Stacking	Learn how to combine your unique skills to stand out in your field.
Module 2: Open Ended Project	**Combine and demonstrate your skills in an open-ended project. Document your project with a short video.**
2.0.1 Open Ended Project	Combine what you've learned to perform a daily task.
2.0.2 Create a Video	Document your new skills by filming and editing a short video.
Introduction to Modern AI course assessment	**Multiple choice quiz to practice and demonstrate what you've learned.**
About the course assessment	Video about the course assessment
Course Assessment	Complete the course assessment
End of Course Survey	Complete the end of course survey
And one more thing	**You'll see...**