Introduction to AI for Middle School

One Semester (55 Contact Hours)

Course Overview and Goals

With Artificial Intelligence becoming integral to many industries, exposing students to AI prepares them for a world where AI literacy will be an essential skill, whether they are building AI technologies or simply using it.

In this semester-long course, students will dive into the world of Artificial Intelligence through engaging lessons and hands-on projects. They will explore core topics such as machine learning, generative AI, prompt engineering, ethics, and the real-world applications of AI in society. Students will also have opportunities to build, test, and reflect on their own AI projects to deepen their understanding.

By the end of the course, students will have a more nuanced understanding of the benefits and challenges associated with AI.

Learning Environment: This course utilizes a blended classroom approach. The content is a mix of web-based and physical activities. Teachers utilize tools and resources provided by CodeHS to leverage time in the classroom and give focused 1-on-1 attention to students.

Technology Requirements

To complete this course, students will need access to the following third-party AI tools:

- ChatGPT, Gemini, and/or Copilot
  Students will need access to an LLM for many of the activities in this course. The activity instructions are designed so they can be completed with ChatGPT, Gemini, Copilot, but other LLMs could work as well.
- Google Teachable Machine
  This tool allows students to create machine learning models without any coding or technical expertise. Without this tool, several lessons will need to be modified.

See the course whitelist for a list of all third-party websites: codehs.com/lms/course_whitelist/intro-ai-ms

Prerequisites

This course is designed for complete beginners with no previous background in computer science or AI, but can be taken by students who have experience with these fields.

More information: Browse the content of this course at https://codehs.com/course/27885

Course Breakdown

Module 1: What is AI? (14-16 hours)

In this module, students will build a foundational understanding of artificial intelligence by exploring what AI is, where it appears in everyday life, and how it differs from other technologies. Through examples, discussions, and interactive activities, they'll examine different types of AI systems. Students train their own mini model and design an original AI helper.

Objectives / Topics Covered	• What is AI? • Staying Safe with AI • How AI Learns from Data • Project: Training a Mini-Model • What is Machine Learning? • Types of Machine Learning • Project: Design Your Own AI Helper

Example Assignments	• Train-A-Bot
	  ○ Design and train a virtual AI bot. Choose what it will learn, decide how much data to give it, and test how fair and accurate it is.
	• Unsupervised Learning: Emoji Clusters
	  ○ Sort the emojis into groups in any way that makes sense, then compare to a computer's groupings.

Module 2: Communicating with AI (12-14 hours)

Students will learn how to effectively interact with AI systems by practicing prompt creation, testing chatbot responses, and even fooling AI into giving incorrect responses. Through hands-on projects and guided explorations, they'll see how inputs shape outputs, and how communication strategies can make AI more useful and accurate.

Objectives / Topics Covered	• Communicating with AI • Large Language Models (LLMs) • Tool Exploration • Challenging Conversations • Prompt Engineering • Prompt Injections • Can You Stump an AI?

Example Assignments	• Train Your Language System Model
	  ○ Train a model to recognize student-created symbols.
	• Stump an AI
	  ○ Intentionally mislead a chatbot into hallucinating information.

Module 3: Generative AI (12-14 hours)

Students will experiment with generative AI tools that create text, images, music, and more. Through creative projects and guided challenges, they'll explore how generative models combine existing knowledge in new ways, and reflect on both the exciting possibilities and the limitations of AI-driven creativity.

Objectives / Topics Covered	• Generative AI • Generative AI Art • Project: Generative AI Art Show • AI and Music Generation

	• Does AI Know How to Code? • Project: AI-Assisted Coding

Example Assignments	• Campaign Poster Project: The Big AI Art Vote
	  ○ Create a campaign poster in favor of or against using AI-generated art in schools.
	• Generate an AI Beat!
	  ○ Use AI tools to generate original beats.
	• Project: AI-Assisted Coding
	  ○ Make a small app, tool, or project with the help of an AI coding assistant. The AI helps write code, fix mistakes, and add changes.

Module 4: AI's Impacts on Society (12-14 hours)

Students will investigate how AI affects individuals, communities, and the world at large. Through readings, discussions, and reflection activities, they'll examine topics such as bias, fairness, and ethics in AI, while also considering the benefits, risks, and responsibilities of using AI in everyday life.

Objectives / Topics Covered	• AI at Work: Changing Careers • Debate: Should AI Replace Certain Jobs? • Ethics, Bias, and Risks of AI • AI and Accessibility • Case Study: AI Tools for Accessibility • Advising the Mayor: Impacts of AI • Your Future with AI

Example Assignments	• AI Advisor: Letter to the Mayor
	  ○ Research one area where AI is making an impact on the world and then write a clear, helpful letter to the mayor with recommendations.
	• AI for Accessibility
	  ○ Explore real-world AI tools that help people. Find out what problems they solve, who they help, how they work, and why they are important.

Alternative Assignments

The alternative assignments provide low-tech ways for students to engage with each module's content.

Objectives / Topics Covered	• What is AI? • Communicating with AI • Generative AI • AI's Impacts on Society

Example Assignments	• Sweden launches AI music licence to protect songwriters
	  ○ Explore how government policies are changing in response to AI.
	• Q&A: How AI affects kids' creativity
	  ○ Consider how AI may affect students' creativity.