Introduction to AI for High School

High School - One Semester (55 hours)

Course Overview and Goals

Artificial Intelligence (AI) is transforming the way we live, work, and learn. In this one-semester course, students will explore core AI concepts such as machine learning, large language models, bias, ethics, and prompt engineering. Through hands-on activities and critical discussions, students will gain foundational AI literacy while responsibly using tools like ChatGPT, Gemini, Teachable Machine, and more.

Learning Environment

This course utilizes a blended classroom approach. The content is fully web-based, with students working within the CodeHS platform as well as third-party tools. Each module of the course is broken down into lessons. Lessons consist of content delivered through video and article connections, reflections, and hands-on tool explorations. Units end in a project, unit quiz, or both.

Technology Requirements

Students will interact with third-party tools. Tools include:

- ChatGPT
- Gemini
- Hugging Face
- Teachable Machine
- Lakera
- Quick Draw
- Soundraw.io

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/26730/explore

Course Breakdown

Module 1: Intro to AI (9-10 hours)

In this module, students will gain an understanding of the main concepts and vocabulary around AI.

Objectives / Topics Covered	• How to Use AI Tools Safely • Human and Artificial Intelligence • Generative vs Predictive AI • Large Language Models • Prompt Engineering • Prompt Practice & Refinement • Who Builds AI?

Example Assignments	• Generative vs Predictive
	  ○ Students explore different applications of AI
	• Large Language Models: Chatbot Arena
	  ○ Students compare LLMs through the Chatbot Arena tool
	• Prompt Engineering: Generate an Image
	  ○ Students use prompt engineering techniques to generate an image

AI Tools/Permissions	• ChatGPT/Gemini • Hugging Face • Quick, Draw! • Google Experiments • Soundraw.io

Module 2: Project: AI in My Life (2-4 hours)

Students will explore how artificial intelligence appears in their everyday lives and select one to research in depth. They will analyze how the AI works, why it's used, and evaluate its benefits and risks, including issues like bias, safety, and fairness, in a short written report or slideshow presentation supported by at least one reputable source.

Objectives / Topics Covered	• Brainstorming AI in Daily Life • Peer Review • Reflection

Module 3: Machine Learning (7-8 hours)

Students will learn the fundamentals of machine learning, covering its lifecycle, supervised, unsupervised, and reinforcement learning, and explore bias within learning models.

Objectives / Topics Covered	• Introduction to Machine Learning • Supervised Learning • Unsupervised Learning • Reinforcement Learning • Data's Role in Machine Learning • Project: Build a Sorting Machine

Example Assignments	• Introduction to ML: CNN Visualization
	  ○ Students observe how a CNN gathers data on an image and makes a prediction as to what it could represent
	• Supervised Learning: Apples vs Bananas
	  ○ Students train a model that categorizes apples and bananas
	• Unsupervised Learning: Bird Sounds
	  ○ Students explore how an AI used unlabeled data to categorize bird sounds
	• Reinforcement Learning: Reinforcement Learning Game
	  ○ Students engage with a visual depiction of reinforcement learning.

AI Tools/Permissions	• ChatGPT/Gemini • Teachable Machine

Module 4: Training AI Models (7-8 hours)

In this hands-on module, students will learn how to train AI models and will explore the use cases for AI in various industries.

Objectives / Topics Covered	• How Are AI Models Trained? • AI Models in Industry • Bias in Training • Ethics and AI • Project: Ethics Case Study

Example Assignments	• How Are AI Models Trained: Turning on a Light
	  ○ Students train and use an AI model to control a program
	• AI Models in Industry
	  ○ Students pick an industry to explore use cases of AI
	• Bias in Training
	  ○ Students explore multiple ways bias creeps into AI programs through the use of bad training data

AI Tools/Permissions	• Survival of the Best Fit • Teachable Machine

Module 5: Risks of AI (10-11 hours)

Students will explore the ethical implications and risks of AI technology, including bias, hallucinations, security, misinformation, and legal challenges. Students will engage in a debate about AI and create their own AI policies.

Objectives / Topics Covered	• Effects of Using Biased AI • Hallucinations and Security Risks • Deepfakes and Misinformation • Project: AI on Trial • You, Your Data, and AI • Environmental Impacts of AI • AI Governance and the Future of AI • Project: Designing a Responsible AI Future

Example Assignments	• Effects of Using Biased AI
	  ○ Students explore how using biased AI affects people in negative ways
	• Hallucinations and Security Risks: Image Prompt Injection
	  ○ Students explore the security risks involved with using LLMs and they simulate a prompt injection using an image
	• Deepfakes and Misinformation
	  ○ Students learn how deepfakes are created and how they can spot and defend themselves from the dangers they pose
	• Project: AI on Trial
	  ○ Students explore the legal challenges that generative AI faces and they prepare for and engage in a debate around this topic
	• You, Your Data, and AI
	  ○ Students weigh the tradeoffs of creating a digital footprint and using AI
	• Environmental Impacts of AI
	  ○ Students create a one-pager of the pros and cons of an AI-related environmental topic
	• AI Governance and the Future of AI
	  ○ Students explore existing AI policies before developing their own

AI Tools/Permissions	• ChatGPT/Gemini • Lakera

Module 6: Coding with AI Tools (9-10 hours)

Students will create a game then solve a real world problem with the help of AI.

Objectives / Topics Covered	• Introduction to AI-Assisted Coding • Project: AI-Assisted Coding

Example Assignments	• Introduction to AI-Assisted Coding
	  ○ Students create their own Connections Game with the help of AI
	• Project: AI-Assisted Coding
	  ○ Students solve a real-world problem with AI assistance

AI Tools/Permissions	• ChatGPT/Gemini

Module 7: Careers and AI (7-8 hours)

Students will explore the changing landscape of work in the age of AI.

Objectives / Topics Covered	• AI Across Industries and Careers • Exploring AI-Specific Career Paths • Looking Ahead at Careers & Applications • Project: Future of Work

Example Assignments	• AI Across Industries and Careers
	  ○ Students explore how industries transform with technological advances
	• Exploring AI-Specific Career Paths
	  ○ Students take a Career Quiz then explore AI-specific jobs
	• Looking Ahead at Careers & Applications
	  ○ Students consider how learning to use AI can help in many types of jobs

AI Tools/Permissions	• ChatGPT/Gemini

Supplemental: Alternative Assignments

The alternative assignments provide a variety of low-tech, accessible, or different ways for students to engage with each module's content. Choose to supplement or replace activities as needed.

Objectives / Topics Covered	• Intro to AI • Machine Learning • Training AI Models • Risks of AI • Coding with AI Tools • Careers and AI

Example Assignments	• Machine Learning: Sort It Out! Be the AI
	  ○ Students act like an AI model and learn from labeled "training data" then make predictions on new, unlabeled "mystery data"
	• Risks of AI: AI Ethics Board
	  ○ Students read situations where an AI may have made an unfair decision, then decide if the AI was fair or unfair, and explain how to improve it