AiCAMP

CURRICULUM OVERVIEW

Year 7-10
Afterschool Program

Contact Information:

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Term 1 🤖
Artificial Intelligence Foundations: From Code to Intelligent Systems

This term will introduce students in Years 7–10 to the core foundations of artificial intelligence, combining coding, data, algorithms, and machine learning into a coherent learning journey. Rather than learning isolated concepts, students will:

- Build real AI systems
- Understand how algorithms solve problems
- Explore how data drives intelligence
- Apply machine learning to real-world decisions

The course is structured around 9 project-based lessons, where students progressively move from writing code → analysing data → building AI models.

Learning Goals

Students will:

Knowledge

- Understand key AI concepts: algorithms, data, machine learning
- Recognise how AI systems are built and applied

Skills

- Develop Python programming foundations
- Analyse and visualise data
- Build simple machine learning models

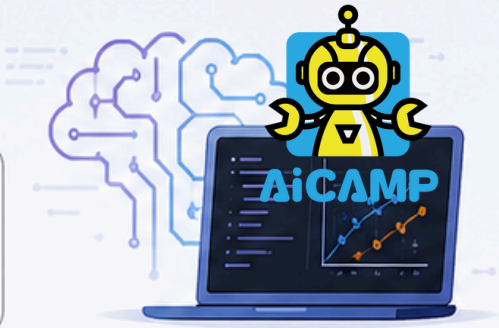
Thinking

- Computational thinking
- Problem-solving with algorithms
- Critical reflection on AI systems

AI & MACHINE LEARNING ROADMAP

9-LESSON CURRICULUM OUTLINE FOR YEARS 7–10

Build the skills to understand, design and create intelligent systems.
From Python programming to Machine Learning and AI decision making, you'll learn the tools and thinking used to solve real-world problems.



THINK CRITICALLY | SOLVE PROBLEMS | WORK WITH DATA | BUILD AI SOLUTIONS | CREATE IMPACT WITH AI

MODULE 1 — What is AI & Why It Matters

1 Lesson 1 – Introduction to AI Systems

- AI history and applications
- What is machine learning?
- Where AI appears in daily life

MODULE 2 — Programming Foundations (Python)

2 Lesson 2 – Python Basics

- Variables
- Input / Output
- Simple logic

3 Lesson 3 – Control & Data Structures

- Loops and conditions
- Lists
- Basic data handling

4 Lesson 4 – Functions & Problem Solving

- Functions and modular thinking
- Breaking problems into steps

MODULE 3 — Algorithms & Computational Thinking

5 Lesson 5 – What is an Algorithm?

- Definition + real-life examples
- Sorting & searching (conceptual)

6 Lesson 6 – Designing Efficient Solutions

- Comparing strategies
- Intro to recursion vs iteration (conceptual only)

MODULE 4 — Data & AI Thinking

7 Lesson 7 – Data Processing & Visualisation

- What is data?
- Cleaning & organising data
- Basic visualisation (charts)

MODULE 5 — Machine Learning

8 Lesson 8 – Introduction to Machine Learning

- What is a model?
- Regression vs classification

MODULE 6 — AI Decision Making

9 Lesson 9 – Final Project: Build an AI Solution

Students choose a project:

- Predict something (simple regression / classification) OR Decision system (e.g., car choice / recommendation)

FINISH

Build AI solutions that make a difference.

WHAT YOU WILL ACHIEVE

- Confident Python programming
- Strong problem-solving skills
- Understand data and AI concepts
- Build and evaluate AI solutions

KEY SKILLS

- Computational thinking
- Data literacy
- Programming
- Critical analysis
- Collaboration & communication

TOOLS & TECHNOLOGIES

- Python
- Jupyter Notebook / Google Colab
- Data visualisation libraries
- Machine Learning libraries

WHO IS THIS FOR?

Year 7–10 students who are curious about AI and want to build real skills for the future.

Term 2 🤖
Seeing Like a Computer: Introduction to AI, Computer Vision and Deep Learning

This Term 2 course introduces students to how computers “see” and understand the visual world. Through hands-on activities, visual examples, and simple coding or no-code tools, students will explore how images are represented as data, how AI detects patterns, and how modern deep learning systems recognise objects, motion, and human actions.
The course gradually moves from still images to video understanding. Students will first learn about pixels, image transformations, edges, features, and classifiers. They will then explore neural networks, convolutional neural networks, object tracking, and action recognition. By the end of the term, students will create or design a simple AI vision project that demonstrates their understanding of computer vision.

Overall Learning Goals
By the end of the course, students should be able to:

1. Understand that digital images are made of pixels and represented by numbers.
2. Explain how computers process images using brightness, colour, filters, edges, and features.
3. Understand the basic idea of training data and image classification.
4. Describe how neural networks and CNNs help AI recognise complex image patterns.
5. Understand that videos are made of frames and that AI can analyse movement across frames.
6. Explain basic ideas such as object tracking, pose detection, and action recognition.
7. Discuss real-world applications of computer vision in areas such as healthcare, sports, robotics, security, self-driving cars, and wildlife monitoring.
8. Reflect on ethical issues related to AI vision systems, especially privacy, surveillance, bias, and responsible use.

Term 3 🤖

Natural Language Processing: How Machines Understand and Generate Language

Language is one of the most complex forms of human intelligence. In this course, students explore how machines process, understand, and generate human language. Through a structured 9-lesson journey, students will:

- Learn how computers represent and analyse text
- Build systems that classify and interpret language
- Explore how AI can generate new content

The program is inspired by real NLP pipelines such as:

- Text representation
- Feature extraction
- Language understanding
- Sequence modelling and generation

Students will move from basic text processing → intelligent language systems.

Learning Goals

Knowledge

- Understand key NLP concepts: tokenisation, features, models
- Recognise how AI systems process language

Skills

- Analyse text using computational methods
- Build simple NLP pipelines
- Design language-based AI systems

Thinking

- Structured thinking about language
- Data-driven reasoning
- Critical evaluation of AI-generated content

Term 4 🤖
AI Intelligence: From Uncertainty to Creation

In Term 4, students move beyond basic AI concepts into how intelligent systems make decisions, learn from uncertainty, and generate new content.
This course introduces:

- How AI deals with uncertainty (probability)
- How machines simulate and predict outcomes
- How AI can create (generative models)
- How systems learn through interaction (reinforcement learning)

Inspired by real AI pipelines such as:

- Probabilistic reasoning
- Monte Carlo simulation
- Bayesian inference
- Generative models and AI creativity

Students will experience AI not just as tools — but as thinking systems.

🧠 Learning Goals

Knowledge

- Understand probability, sampling, and AI decision-making
- Explore how AI generates images, text, and ideas
- Learn how machines improve through feedback

Skills

- Build simple simulation models
- Design probabilistic reasoning systems
- Create AI-generated outputs

Thinking

- Reason under uncertainty
- Model real-world problems
- Critically evaluate AI creativity

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