NEW HORIZON
COLLEGE OF ENGINEERING
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DEPARTMENT OF ARTIFICIAL INTELEGENCE AND MACHINE LEARNING

AI Olympiad Syllabus – Detailed Chapter Outline (Classes 6–10)

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The AI Olympiad Syllabus for Classes 6–10 is designed to provide a structured and progressive introduction to the fundamentals of Artificial Intelligence. It follows a common syllabus model where all students are exposed to the same core concepts, while the complexity and depth of questions vary by grade level.

The syllabus is organized into 12 chapters, covering the full AI learning spectrum, from basic awareness and data literacy to machine learning concepts, real-world applications, and ethical considerations. It emphasizes conceptual clarity, logical reasoning, and practical understanding rather than rote memorization or advanced programming.

This framework ensures that students not only learn how AI works but also develop the ability to think critically about its applications and societal impact.

Chapter 1: AI Around Us & Fundamentals

Focus: Awareness and basic understanding

Subtopics:

Definition of Artificial Intelligence

AI vs Human Intelligence

AI vs traditional programming (basic idea)

Examples of AI in daily life (voice assistants, maps, recommendations)

Smart devices and automation

Learning Outcome:

Students will be able to identify and explain AI concepts and recognize AI applications in everyday life.

Chapter 2: Data – The Foundation of AI

Focus: Understanding data in AI

Subtopics:

What is data

Types of data:

Text

Images

Audio

Numerical

Structured vs unstructured data

Sources of data

Role of data in AI systems

Learning Outcome:

Students will understand the importance of data and how it powers AI systems.

Chapter 3: Data Quality, Bias & Fairness

Focus: Data reliability and ethics

Subtopics:

Dataset creation (basic idea)

Data quality issues (missing, incorrect data)

Introduction to bias in data

Fairness in AI systems

Real-life examples of biased AI

Learning Outcome:

Students will recognize how data quality and bias affect AI outcomes and fairness.

Chapter 4: Exploratory Data Analysis (EDA)

Focus: Understanding and analyzing data

Subtopics:

Organizing data

Data visualization (charts, graphs)

Measures of central tendency (mean, median, mode)

Identifying patterns

Detecting outliers

Learning Outcome:

Students will be able to interpret data and identify patterns using simple analysis techniques.

Chapter 5: Computational Thinking & Problem Solving

Focus: Logical thinking and structured problem-solving

Subtopics:

What is computational thinking

Decomposition (breaking problems)

Pattern recognition

Abstraction

Logical reasoning basics

Learning Outcome:

Students will develop the ability to approach problems logically and systematically.

Chapter 6: Algorithms and Flowcharts

Focus: Step-by-step problem solving

Subtopics:

Definition of algorithms

Characteristics of a good algorithm

Writing simple algorithms

Flowcharts (symbols and basics)

Everyday examples of algorithms

Learning Outcome:

Students will be able to design and interpret simple algorithms and flowcharts.

Chapter 7: Introduction to Machine Learning

Focus: Core concept of AI

Subtopics:

What is Machine Learning

Difference between AI and ML

Learning from data

Basic examples of ML applications

Learning Outcome:

Students will understand how machines learn from data and improve performance.

Chapter 8: Types of Machine Learning

Focus: Understanding ML approaches

Subtopics:

Supervised learning

Unsupervised learning

Classification vs regression

Clustering (grouping similar data)

Simple real-life examples

Learning Outcome:

Students will differentiate between types of machine learning and their applications.

Chapter 9: How AI Learns & Makes Decisions

Focus: AI working mechanism

Subtopics:

Input → Process → Output model

Pattern recognition

Prediction basics

Decision-making in AI

Accuracy and errors (basic idea)

Learning Outcome:

Students will understand how AI systems process information and make predictions.

Chapter 10: Neural Networks

Focus: Introduction to advanced AI concepts

Subtopics:

Inspiration from the human brain

What is a neural network (basic idea)

Artificial neuron (conceptual)

Input and output layers

Pattern recognition using neural networks

Applications (face recognition, speech recognition)

Learning Outcome:

Students will gain a basic understanding of neural networks and their role in AI systems.

Chapter 11: AI Technologies & Applications

Focus: Real-world AI technologies

Subtopics:

Computer Vision (image recognition)

Natural Language Processing (text and speech)

Recommendation systems

Robotics basics

Applications in industries (healthcare, education, transport, entertainment)

Learning Outcome:

Students will identify key AI technologies and understand their real-world applications.

Chapter 12: AI Ethics, Careers & Future Scope

Focus: Responsibility and future awareness

Subtopics:

What is AI ethics

Bias and fairness

Privacy and data protection

Misuse of AI (deepfakes, etc.)

Responsible use of AI

AI careers (AI Engineer, Data Scientist, Robotics Engineer)

Skills required for AI careers (basic awareness)

Future scope of AI

Learning Outcome:

Students will understand ethical issues in AI and explore future career opportunities in the field.