

MAHARAJA AGRASEN MODEL SCHOOL
SYLLABUS BREAK UP FOR SESSION: (2024-2025)
CLASS – X

ARTIFICIAL INTELLIGENCE (SUB. CODE 417)

LEARNING OBJECTIVES :

1. To help learners understand the world of Artificial Intelligence and its applications through games, activities, and multi-sensory learning to become AI-ready.
2. To introduce the learners to the three domains of AI in an age-appropriate manner.
3. To allow the learners to construct the meaning of AI through interactive participation and engaging hands-on activities.
4. To introduce the learners to AI Project Cycle.
5. To introduce the learners to programming skills - Basic python coding language.

LEARNING OUTCOMES:

- Recognize and value artificial intelligence (AI) in everyday life.
- Apply Human-Machine interaction principles across AI domains: Data, Computer Vision, and Natural Language Processing, with ongoing self-assessment.
- Reflect on and prepare for future job opportunities, considering emerging skill requirements.
- Engage in creative storytelling around smart home concepts, fostering imagination.
- Understand AI's role in Sustainable Development Goals for responsible

citizenship.

- Research and cultivate awareness of future job skills.
- Acknowledge AI bias, access, and ethical considerations.
- Cultivate effective communication and collaboration skills.
- Familiarize with AI concepts and project cycles, fostering motivation.

Learn problem scoping, goal-setting, and ethical brainstorming in AI projects, with iterative problem-solving approaches.

Text Book : [CBSE TEXT BOOK](#) (CHAPTERWISE NOTES ARE GIVEN AS LINK IN CURRICULUM)

Link to AI Activities & Jupyter Notebooks (including sample projects)
[https://bit.ly/class X activities jupyter notebooks](https://bit.ly/class_X_activities_jupyter_notebooks)

Total Marks: 100 (Theory-50 + Practical-50)

	UNITS	NO. OF HOURS for Theory and Practical	MAX. MARKS for Theory and Practical
	Employability Skills		
	Unit 1: Communication Skills-II	10	2
	Unit 2: Self-Management Skills-II	10	2
	Unit 3: ICT Skills-II	10	2
	Unit 4: Entrepreneurial Skills-II	15	2
	Unit 5: Green Skills-II	05	2
	Total	50	10
	Subject Specific Skills		
	Unit 1: Introduction to Artificial Intelligence (AI)		7
	Unit 2: AI Project Cycle		9
	Unit 3: Advance Python (To be assessed in Practicals only)		--

Unit 4: Data Science (Introduction, Applications of Data Sciences, Data Science: Getting Started (up to Data Access), <i>remaining portion is to be assessed in practical</i>)		4
Unit 5: Computer Vision (Introduction, Applications of Computer Vision, Computer Vision: Getting Started (up to RGB Images), <i>remaining portion is to be assessed in practical</i>)		4
Unit 6: Natural Language Processing		8
Unit 7: Evaluation		8
Total		40
Practical Work:		
Practical File with minimum 15 Programs		15
Practical Examination <ul style="list-style-type: none"> • Unit 3: Advance Python • Unit 4: Data Science • Unit 5: Computer Vision 		5
		5
		5
Viva Voce		5
Total		35
Project Work / Field Visit / Student Portfolio (Any one to be done)		10
	Viva Voce	5
	Total	15
GRAND TOTAL	200	100

DETAILED CURRICULUM/TOPICS FOR CLASS X

Part-A: EMPLOYABILITY SKILLS

S. No.	Units	Month
1.	Unit 1: Communication Skills-II	April - May
2.	Unit 2: Self-management Skills-II	July
3.	Unit 3: Information and Communication Technology Skills-II	Aug
4.	Unit 4: Entrepreneurial Skills-II	Sep
5.	Unit 5: Green Skills-II	Oct

PART - B

UNIT 1: INTRODUCTION TO ARTIFICIAL INTELLIGENCE

SUB-UNIT	LEARNING OUTCOMES	SESSION/ ACTIVITY/ PRACTICAL
APRIL & MAY		
CHAPTER 1 NOTES - CLICK TO DOWNLOAD		
Foundational concepts of AI	Understand the concept of human intelligence and its various components such as reasoning, problem-solving, and creativity	Session: What is Intelligence?
		Session: Decision Making. <ul style="list-style-type: none"> • How do you make decisions? • Make your choices!
		Session: what is Artificial Intelligence and what is not?
Basics of AI: Let's Get Started	Understand the concept of Artificial Intelligence (AI) and its domains	Session: Introduction to AI and related terminologies. <ul style="list-style-type: none"> • Introducing AI, ML & DL. • Introduction to AI Domains (Data Sciences, CV & NLP) • Gamified tools for each domain- <ul style="list-style-type: none"> o Data Sciences-Impact Filter (Impact of rise in temperature on different species) <p>https://artsexperiments.withgoogle.com/impactfilter/</p> <ul style="list-style-type: none"> o CV- Autodraw (It pairs machine learning with drawings from talented

		<p>artists to help you draw stuff fast.)</p> <p>https://www.autodraw.com/</p>
SUB-UNIT	LEARNING OUTCOMES	SESSION/ ACTIVITY/ PRACTICAL
		<ul style="list-style-type: none"> o NLP- Wordtune (AI writing tool that rewrites, rephrases, and rewords your writing) <p>https://www.wordtune.com/</p>
	Explore the use of AI in real Life.	Session: Applications of AI – A look at Real-life AI implementations
	Learn about the ethical concerns involved in AI development, such as AI bias, data privacy and how they can be addressed.	<p>Session: AI Ethics</p> <ul style="list-style-type: none"> • Moral Machine Activity : a platform for gathering a human perspective on moral decisions made by machine intelligence, such as self-driving cars. <p>http://moralmachine.mit.edu/</p>
		<p>Python</p> <p>Recap Concepts – Data Types, Variables, Operators, Selection & Iteration</p> <p>- Lists</p> <p>Practical File Programs (1-4)</p>
	CBSE Question Bank	<ol style="list-style-type: none"> 1. Click to download 2. Click to Download

UNIT 2 : AI PROJECT CYCLE

JULY		
SUB-UNIT	LEARNING OUTCOMES	SESSION/ ACTIVITY/ PRACTICAL
CHAPTER 2 NOTES - CLICK HERE TO DOWNLOAD		
Introduction	Understand the stages involved in the AI project cycle, such as problem scoping, data collection, data exploration, modeling, evaluation.	Session: Introduction to AI Project Cycle
Problem Scoping	Learn about the importance of project planning in AI development and how to define project goals and objectives.	Session: Understanding Problem Scoping & Sustainable Development Goals
Data Acquisition	Develop an understanding of the importance of data collection in AI and how to choose the right data sources.	Session: Simplifying Data Acquisition
Data Exploration	Know various data exploration techniques and its importance	Session: Visualising Data

Modelling	Know about the different machine learning algorithms used to train AI models	Session: Introduction to modelling <ul style="list-style-type: none"> • Introduction to Rule Based & Learning Based AI Approaches • Activity : Teachable machine to demonstrate Supervised Learning https://teachablemachine.withgoogle.com/ • Activity : Infinite Drum Machine to demonstrate Unsupervised learning https://experiments.withgoogle.com/ai/drum-machine/view/ • Introduction to Supervised, Unsupervised & Reinforcement Learning Models • Neural Networks
Evaluation	Know the importance of evaluation and various metrics available for evaluation	Session: Evaluating the idea!
	CBSE Question Bank	<u>Click here to download</u>

UNIT 4: DATA SCIENCES (To be assessed through Theory)

AUGUST		
SUB-UNIT	LEARNING OUTCOMES	SESSION/ PRACTICAL ACTIVITY/
DATA SCIENCE NOTES : <u>CLICK HERE TO DOWNLOAD</u>		
Introduction	Define the concept of Data Science and understand its applications in various fields.	Session: Introduction to Data Science
		Session: Applications of Data Science

Getting Started	Understand the basic concepts of data acquisition, visualization, and exploration.	Session: Revisiting AI Project Cycle, Data Collection, Data Access Activities: Game: Rock, Paper & Scissors https://next.rockpaperscissors.ai/
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UNIT 4: DATA SCIENCES (To be assessed through Practicals)

SUB-UNIT	LEARNING OUTCOMES	SESSION/ ACTIVITY/ PRACTICAL
Python Packages	Use Python libraries such as NumPy, Pandas, and Matplotlib for data analysis and visualization.	Session: Python for Data Sciences <ul style="list-style-type: none"> ● Numpy ● Pandas ● Matplotlib
Concepts of Data Sciences	Understand the basic concepts of statistics, such as mean, median, mode, and standard deviation, and apply them to analyze data using various Python packages.	Session: Statistical Learning & Data Visualisation Practical Questions – 4 to 10

UNIT 5: COMPUTER VISION (To be assessed through Theory)

AUGUST		
SUB-UNIT	LEARNING OUTCOMES	SESSION/ ACTIVITY/ PRACTICAL
COMPUTER VISION NOTES : CLICK HERE TO DOWNLOAD		
Introduction	Define the concept of Computer Vision and understand its applications in various fields.	Session: Introduction to Computer Vision
		Session: Applications of CV

Concepts of Computer Vision	Understand the basic concepts of image representation, feature extraction, object detection, and segmentation.	Session: Understanding CV Concepts <ul style="list-style-type: none"> • Computer Vision Tasks • Basics of Images-Pixel, Resolution, Pixel value • Grayscale and RGB images Activities: <ul style="list-style-type: none"> • Game- Emoji Scavenger Hunt https://emojiscavengerhunt.withgoogle.com/ • RGB Calculator: https://www.w3schools.com/colors/colors_rgb.asp • Create your own pixel art: www.piskelapp.com • Create your own convolutions: http://setosa.io/ev/image-kernels/
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UNIT 5: COMPUTER VISION (To be assessed through Practicals)

SUB-UNIT	LEARNING OUTCOMES	SESSION/ ACTIVITY/ PRACTICAL
OpenCV	Use Python libraries such as OpenCV for basic image processing and computer vision tasks.	Session: Introduction to OpenCV Hands-on: Image Processing Practical Question (11-15)

UNIT 6: NATURAL LANGUAGE PROCESSING

OCTOBER		
SUB-UNIT	LEARNING OUTCOMES	SESSION/ ACTIVITY/ PRACTICAL
NLP NOTES : CLICK HERE TO DOWNLOAD		
Introduction	Understand the concept of Natural Language Processing (NLP) and its importance in the field of	Session: Introduction to Natural Language Processing Activity : Use of Google

Model Evaluation Terminology	Learn various Model Evaluation Terminologies	Session: Model Evaluation Terminologies <ul style="list-style-type: none"> • The Scenario - Prediction, Reality, True Positive, True Negative, False Positive, False Negative • Confusion Matrix • Activity- to make a confusion matrix based on data given for Containment Zone Prediction Model
Confusion Matrix	Learn to make a confusion matrix for given Scenario	Session & Activity: Confusion Matrix
Evaluation Methods	Learn about the different types of evaluation techniques in AI, such as Accuracy, Precision, Recall and F1 Score, and their significance.	Session: Evaluation Methods <ul style="list-style-type: none"> • Accuracy • Precision • Recall • Which Metric is Important? - Precision or Recall • F1 Score
	CBSE Question Bank	Click Here to Download

PART-C: PRACTICAL WORK

PRACTICAL FILE INDEX LINK [Practical File 2024-25](#)

PART-D: Project Work / Field Visit / Student Portfolio * relate it to Sustainable Development Goals Suggested Projects/ Field Visit / Portfolio (any one activity to be one)

Field Work	Students' participation in the following- <ul style="list-style-type: none"> • AI for Youth Bootcamp • AI Fests/ and Exhibition • Participation in any AI training sessions • Virtual tours of companies using AI to get acquainted with real-life usage
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Student Portfolio (to be continued from class IX)	<ul style="list-style-type: none">● Maintaining a record of all AI activities● Hackathons● Competitions (CBSE/Interschool) <p>Note: Portfolio should contain minimum 5 activities</p>
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Mid Term Examination -

UNIT 1: INTRODUCTION TO ARTIFICIAL INTELLIGENCE

UNIT 2: AI PROJECT CYCLE

UNIT 3: DATA SCIENCE

UNIT 4: COMPUTER VISION

PREBOARD EXAMINATION

WHOLE SYLLABUS