CBSE | Department of Skill Education

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ARTIFICIAL INTELLIGENCE (CODE 417)

CURRICULUM FOR CLASS IX (INSPIRE AND ACQUIRE MODULE)

OBJECTIVE

The objective of this module/curriculum - which combines both Inspire and Acquire modules is to develop a readiness for understanding and appreciating Artificial Intelligence and its application in our lives. This module/curriculum focuses on:

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

LEARNING OUTCOMES

Learners will be able to

1. Identify and appreciate Artificial Intelligence and describe its applications in daily life.
2. Relate, apply and reflect on the Human-Machine Interactions to identify and interact with the three domains of AI: Data, Computer Vision and Natural Language Processing and Undergo assessment for analysing their progress towards acquired AI-Readiness skills.
3. Imagine, examine and reflect on the skills required for futuristic job opportunities.
4. Unleash their imagination towards smart homes and build an interactive story around it.
5. Understand the impact of Artificial Intelligence on Sustainable Development Goals to develop responsible citizenship.
6. Research and develop awareness of skills required for jobs of the future.
7. Gain awareness about AI bias and AI access and describe the potential ethical considerations of AI.
8. Develop effective communication and collaborative work skills.
9. Get familiar and motivated towards Artificial Intelligence and Identify the AI Project Cycle framework.

10. Learn problem scoping and ways to set goals for an AI project and understand the iterative nature of problem scoping in the AI project cycle.
11. Brainstorm on the ethical issues involved around the problem selected.
12. Foresee the kind of data required and the kind of analysis to be done, identify data requirements and find reliable sources to obtain relevant data.
13. Use various types of graphs to visualise acquired data.
14. Understand, create and implement the concept of Decision Trees.
15. Understand and visualise computer's ability to identify alphabets and handwritings.
16. Understand and appreciate the concept of Neural Network through gamification and learn basic programming skills through gamified platforms.
17. Acquire introductory Python programming skills in a very user-friendly format.

UNIT WISE DISTRIBUTION

UNIT	NAME OF THE UNIT	SUB-UNIT	DURATION	PERIODS
1	INTRODUCTION TO AI	**Excite**	2 Hours 40 Mins.	4 Periods
		Relate	02 Hours	3 Periods
		Purpose	02 Hours	3 Periods
		Possibilities	02 Hours	3 Periods
		AI Ethics	3 Hours 20 Mins.	5 Periods
2	AI PROJECT CYCLE	**Problem Scoping**	14 Hours	21 Periods
		Data Acquisition	02 Hours	3 Periods
		Data Exploration	04 Hours	6 Periods
		Modelling	06 Hours	9 Periods
3	NEURAL NETWORK		04 Hours	6 Periods
4	INTRODUCTION TO PYTHON		70 Hours	105 Periods
TOTAL			**112 Hours**	**168 Periods**

COURSE OUTLINE

UNIT	SUB-UNIT	SESSION / ACTIVITY / PRACTICAL	LEARNING OUTCOMES
INTRODUCTION TO AI	Excite	**Session**: Introduction to AI and setting up the context of the curriculum	To identify and appreciate Artificial Intelligence and describe its applications in daily life.
		Ice Breaker Activity: Dream Smart Home idea Learners to design a rough layout of floor plan of their dream smart home.	
		Recommended Activity: The AI Game Learners to participate in three games based on different AI domains. • **Game 1: Rock, Paper and Scissors** (based on data) • **Game 2: Mystery Animal** (based on Natural Language Processing - NLP) • **Game 3: Emoji Scavenger Hunt** (based on Computer Vision - CV)	To relate, apply and reflect on the Human-Machine Interactions. To identify and interact with the three domains of AI: Data, Computer Vision and Natural Language Processing.
		Recommended Activity: AI Quiz (Paper Pen/Online Quiz)	To undergo an assessment for analysing progress towards acquired AI-Readiness skills.
		Recommended Activity: To write a letter Writing a Letter to one's future self • Learners to write a letter to self-keeping the future in context. They will describe what they have learnt so far or what they would like to learn someday	To imagine, examine and reflect on the skills required for futuristic job opportunities.
	Relate	**Video Session: To watch a video** Introducing the concept of Smart Cities, Smart Schools and Smart Homes	Learners to relate to application of Artificial Intelligence in their daily lives.
		Recommended Activity: Write an Interactive Story Learners to draw a floor plan of a Home/School/City and write an interactive story around it using **Story Speaker** extension in Google docs.	To unleash their imagination towards smart homes and build an interactive story around it. To relate, apply and reflect on the Human-Machine Interactions.

UNIT	SUB-UNIT	SESSION / ACTIVITY / PRACTICAL	LEARNING OUTCOMES
	Purpose	**Session:** Introduction to **sustainable development goals**	To understand the impact of Artificial Intelligence on Sustainable Development Goals to develop responsible citizenship.
		Recommended Activity: Go Goals Board Game Learners to answer questions on Sustainable Development Goals	
	Possibilities	**Session: Theme-based research and Case Studies** • Learners will listen to various case-studies of inspiring start-ups, companies or communities where AI has been involved in real-life. • Learners will be allotted a theme around which they need to search for present AI trends and have to visualise the future of AI in and around their respective theme.	To research and develop awareness of skills required for jobs of the future. To imagine, examine and reflect on the skills required for the futuristic opportunities. To develop effective communication and collaborative work skills.
		Recommended Activity: Job Ad Creating activity Learners to create a job advertisement for a firm describing the nature of job available and the skill-set required for it 10 years down the line. They need to figure out how AI is going to transform the nature of jobs and create the Ad accordingly.	
	AI Ethics	**Video Session: Discussing about AI Ethics**	To understand and reflect on the ethical issues around AI.
		Recommended Activity: Ethics Awareness Students play the role of major stakeholders and they have to decide what is ethical and what is not for a given scenario.	
		Session: AI Bias and AI Access • Discussing about the possible bias in data collection • Discussing about the implications of AI technology	To gain awareness around AI bias and AI access.
		Recommended Activity: Balloon Debate • Students divide in teams of 3 and 2 teams are given same theme. One team goes in affirmation to AI for their section while the other one goes against it. • They have to come up with their points as to why AI is beneficial/harmful for the society.	To let the students analyse the advantages and disadvantages of Artificial Intelligence.

UNIT	SUB-UNIT	SESSION / ACTIVITY / PRACTICAL	LEARNING OUTCOMES
AI PROJECT CYCLE	Problem Scoping	**Session: Introduction to AI Project Cycle** • Problem Scoping • Data Acquisition • Data Exploration • Modelling • Evaluation	Identify the AI Project Cycle framework.
		Activity: Brainstorm around the theme provided and set a goal for the AI project. • Discuss various topics within the given theme and select one. • List down/ Draw a mindmap of problems related to the selected topic and choose one problem to be the goal for the project.	Learn problem scoping and ways to set goals for an AI project.
		Activity: To set actions around the goal. • List down the stakeholders involved in the problem. • Search on the current actions taken to solve this problem. • Think around the ethics involved in the goal of your project.	Identify stakeholders involved in the problem scoped. Brainstorm on the ethical issues involved around the problem selected.
		Activity: Data and Analysis • What are the data features needed? • Where can you get the data? • How frequent do you have to collect the data? • What happens if you don't have enough data? • What kind of analysis needs to be done? • How will it be validated? • How does the analysis inform the action?	Understand the iterative nature of problem scoping for in the AI project cycle. Foresee the kind of data required and the kind of analysis to be done.
		Presentation: Presenting the goal, actions and data.	Share what the students have discussed so far.
	Data Acquisition	**Activity: Introduction to data and its types.** Students work around the scenarios given to them and think of ways to acquire data.	Identify data requirements and find reliable sources to obtain relevant data.
	Data Exploration	**Session: Data Visualisation** • Need of visualising data • Ways to visualise data using various types of graphical tools.	To understand the purpose of Data Visualisation

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		Recommended Activity: Let's use Graphical Tools • To decide what kind of data is required for a given scenario and acquire the same. • To select an appropriate graphical format to represent the data acquired. • Presenting the graph sketched.	Use various types of graphs to visualise acquired data.
	Modelling	**Session: Decision Tree** To introduce basic structure of Decision Trees to students.	Understand, create and implement the concept of Decision Trees.
		Recommended Activity: Decision Tree To design a Decision Tree based on the data given.	
		Recommended Activity: Pixel It • To create an "AI Model" to classify handwritten letters. • Students develop a model to classify handwritten letters by diving the alphabets into pixels. • Pixels are then joined together to analyse a pattern amongst same alphabets and to differentiate the different ones.	Understand and visualise computer's ability to identify alphabets and handwritings.
NEURAL NETWORK		**Session: Introduction to neural network** • Relation between the neural network and nervous system in human body • Describing the function of neural network.	Understand and appreciate the concept of Neural Network through gamification.
		Recommended Activity: Creating a Human Neural Network • Students split in four teams each representing input layer (X students), hidden layer 1 (Y students), hidden layer 2 (Z students) and output layer (1 student) respectively. • Input layer gets data which is passed on to hidden layers after some processing. The output layer finally gets all information and gives meaningful information as output.	

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INTRODUCTION TO PYTHON		**Recommended Activity: Introduction to programming** using Online Gaming portals like Code Combat.	Learn basic programming skills through gamified platforms.
		Session: Introduction to Python language Introducing python programming and its applications	Acquire introductory Python programming skills in a very user-friendly format.
		Practical: Python Basics • Students go through lessons on Python Basics (Variables, Arithmetic Operators, Expressions, Data Types - integer, float, strings, using print() and input() functions) • Students will try some simple problem solving exercises on Python Compiler.	
		Practical: Python Lists • Students go through lessons on Python Lists (Simple operations using list) • Students will try some basic problem solving exercises using lists on Python Compiler.	

SKILLS TO BE DEVELOPED