ARTIFICIAL INTELLIGENCE - 417 (X)
Session 2019-20

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.
	Purpose	**Session:** Introduction to sustainable development goals **Recommended Activity: Go Goals Board Game** Learners to answer questions on Sustainable Development Goals	To understand the impact of Artificial Intelligence on Sustainable Development Goals to develop responsible citizenship.
	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	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.

		and have to visualise the future of AI in and around their respective theme.	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 **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.	To understand and reflect on the ethical issues around AI.

		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.
	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	Learn problem scoping and

		provided and set a goal for the AI project. • Discuss various topics within the given theme and select one. • List down/ Draw a mind map of problems related to the selected topic and choose one problem to be the goal for the project.	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?	Understand the iterative nature of problem scoping for in the AI project cycle. Foresee the kind of 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?	required and the kind of analysis to be done.
	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
		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	Use various types of graphs to visualise acquired data.

		represent the data acquired. • Presenting the graph sketched.	
	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**	Understand and appreciate the

		• Relation between the neural network and nervous system in human body • Describing the function of neural network.	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.	