

## Artificial Intelligence - 417

**CLASS -X**

**Session- 2024-25**

Date	Chapter / Unit	Sub Unit/Content	Demo./Practicals/Session
April No.of working days-22	INTRODUCTION TO ARTIFICIAL INTELLIGENCE (AI)	<p><b>Foundational concepts of AI</b> Understand the concept of human intelligence and its various components such as reasoning, problem-solving, and creativity</p> <p><b>Basics of AI: Let's Get Started</b> Understand the concept of Artificial Intelligence (AI) and its domains</p> <p><b>Explore the use of AI in real Life.</b> Learn about the ethical concerns involved in AI development, such as AI bias, data privacy and how they can be addressed.</p>	<p>Gamified tools for each domain- Data Sciences- Impact Filter (Impact of rise in temperature on different species) <a href="https://artsexperiments.withgoogle.com/impactfilter/">https://artsexperiments.withgoogle.com/impactfilter/</a> CV- Autodraw (It pairs machine learning with drawings from talented artists to help you draw stuff fast.) <a href="https://www.autodraw.com/">https://www.autodraw.com/</a> NLP- Wordtune (AI writing tool that rewrites, rephrases, and rewords your writing) <a href="https://www.wordtune.com/">https://www.wordtune.com/</a> Session: Applications of AI – A look at Real-life AI implementations Moral Machine Activity : a platform for gathering a human perspective on moral decisions made by machine intelligence, such as self-driving cars. <a href="http://moralmachine.mit.edu/">http://moralmachine.mit.edu/</a></p>
	ADVANCE PYTHON	<p>Introduction to Annaconda Understand to work with Jupyter Notebook, Creating virtual environment,</p>	<p>(Introduction to Python) on Jupyter Notebook Installation of Annaconda Coding in Jupyter Notebooks - Operators Precedence Comments in python The print () function The Input() function</p>
May No.of working days-18	AI PROJECT CYCLE	<p><b>Introduction</b> Understand the stages involved in the AI project cycle, such as problem scoping, data collection, data exploration, modeling, evaluation.</p> <p><b>Problem Scoping</b> Learn about the importance of project planning in AI development and how to define project goals and objectives.</p> <p><b>Data Acquisition</b> Develop an understanding of the importance of data collection in AI and how to choose the right data sources.</p> <p><b>Data Exploration</b> Know various data exploration techniques and its importance</p>	<p><b>Data Acquisition /Data Exploration/ Data Visualization</b> <a href="https://public.tableau.com/app/discover">https://public.tableau.com/app/discover</a> <a href="https://www.kaggle.com/learn/data-visualization">https://www.kaggle.com/learn/data-visualization</a> <a href="https://www.datawrapper.de/">https://www.datawrapper.de/</a> <b>Neural Networks</b> <a href="https://playground.tensorflow.org/">https://playground.tensorflow.org/</a></p>
	ADVANCE PYTHON	<p>Installing Python Packages Applications of Python Recap of Python Basics</p>	<p>Errors in Python using Jupyter Notebook Compilation of all the functions and operators in Jupyter (Variables, Arithmetic Operators, Expressions, Comparison Operators, logical operators, Assignment Operators, Data Types - integer, float, strings, type conversion, using print() and input() functions</p>
July No.of working days-25	AI PROJECT CYCLE:	<p><b>Modelling</b> Know about the different machine learning algorithms used to train AI models</p> <p><b>Evaluation</b> Know the importance of evaluation and various metrics available for evaluation</p>	<ul style="list-style-type: none"> <li>● Introduction to Rule Based &amp; Learning Based AI Approaches</li> <li>● Activity : Teachable machine to demonstrate Supervised Learning <a href="https://teachablemachine.withgoogle.com/">https://teachablemachine.withgoogle.com/</a></li> <li>● Activity : Infinite Drum Machine to demonstrate Unsupervised learning <a href="https://experiments.withgoogle.com/ai/drum-machine/view/">https://experiments.withgoogle.com/ai/drum-machine/view/</a></li> </ul>
	ADVANCE PYTHON	<p>Able to write Python programs using fundamental concepts using Jupyter Notebook.</p>	<p>Coding in the Jupyter Notebook (All the previous code done on IDLE python)</p>

August No.of working days-23	NATURAL LANGUAGE PROCESSING	Introduction Understand the concept of Natural Language Processing (NLP) and its importance in the field of Artificial Intelligence (AI). Chatbots Explore the various applications of NLP in everyday life, such as chatbots, sentiment analysis, and automatic summarization. Language Differences Gain an understanding of the challenges involved in understanding human language by machine.	Use of Google Translate for same spelling words (NLP based different Applications ) Smart/Scripted chat bot- <a href="https://www.ometrics.com/blog/list-of-fun-chatbots/">https://www.ometrics.com/blog/list-of-fun-chatbots/</a> <a href="https://www.cleverbot.com/">https://www.cleverbot.com/</a> <a href="https://www.pandorabots.com/mitsuku/">https://www.pandorabots.com/mitsuku/</a> Human Language VS Computer Language
	ADVANCE PYTHON	Able to use Python built-in functions and libraries	Codeing in the Jupyter Notebook (All the previous code done on IDLE python)
September No.of working days-23	NATURAL LANGUAGE PROCESSING	Concepts of Natural Language Processing Learn about the Text Normalization technique used in NLP and popular NLP model - Bag-of-Words	1. Sentence Segmentation: <a href="https://tinyurl.com/y36hd92n">https://tinyurl.com/y36hd92n</a> 2. Tokenisation: <a href="https://text-processing.com/demo/tokenize/">https://text-processing.com/demo/tokenize/</a> 3. Stopwords removal: <a href="https://demos.datasciencedojo.com/demo/stopwords/">https://demos.datasciencedojo.com/demo/stopwords/</a> 4. Lowercase conversion: <a href="https://caseconverter.com/">https://caseconverter.com/</a> 5. Stemming: <a href="http://textanalysisonline.com/nltk-porter-stemmer">http://textanalysisonline.com/nltk-porter-stemmer</a> 6. Lemmatisation: <a href="http://textanalysisonline.com/spacy-word-lemmatize">http://textanalysisonline.com/spacy-word-lemmatize</a> 7. Bag of Words: Create a document vector table for all documents. 8. Generate TFIDF values for all the words. 9. Find the words having highest value. 10. Find the words having the least value
	ADVANCE PYTHON	Submission and assessment of the projects/ Prcatical files	
October No.of working days-20	EVALUATION	Introduction Understand the role of evaluation in the development and implementation of AI systems. Model Evaluation Terminology Learn various Model Evaluation Terminologies Confusion Matrix Learn to make a confusion matrix for given Scenario Evaluation Methods Learn about the different types of evaluation techniques in AI, such as Accuracy, Precision, Recall and F1 Score, and their significance.	Evaluation techniques- Underfit, Perfect Fit, OverFit through different graphs and examples Model Evaluation Terminologies ● 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 Activity: Confusion Matrix Evaluation Methods ● Accuracy ● Precision ● Recall ● Which Metric is Important? - Precision or Recall ● F1 Score
	ADVANCE PYTHON	Control Structures Sequential Statements Lists in Python	<ul style="list-style-type: none"> <li>• Create a list in Python of children selected for science quiz with following names- Arjun, Sonakshi, Vikram, Sandhya, Sonal, Isha, Kartik</li> <li>Perform the following tasks on the list in sequence- <ul style="list-style-type: none"> <li>○ Print the whole list</li> <li>○ Delete the name “Vikram” from the list</li> <li>○ Add the name “Jay” at the end</li> <li>○ Remove the item which is at the second position.</li> </ul> </li> <li>• Create <ul style="list-style-type: none"> <li>○ a list num=[23,12,5,9,65,44] Print the length of the list</li> <li>○ Print the elements from second to fourth position using positive indexing</li> <li>○ Print the elements from position third to fifth using negative indexing</li> </ul> </li> <li>• Create a list of first 10 even numbers, add 1 to each list item and print the final list.</li> <li>• Create a list List_1=[10,20,30,40]. Add the elements [14,15,12] using extend function. Now sort the final list in ascending order and print it.</li> </ul>

November No.of working days-23	DATA SCIENCE	Introduction Define the concept of Data Science and understand its applications in various fields. Getting Started Understand the basic concepts of data acquisition, visualization, and exploration.	Revisiting AI Project Cycle, Data Collection, Data Access Activities: Game: Rock, Paper & Scissors <a href="https://next.rockpaperscissors.ai/">https://next.rockpaperscissors.ai/</a>
	EMPLOYABILITY SKILLS	Unit 1: Communication Skills-II Unit 2: Self-management Skills-II	Python for Data Sciences • Numpy • Pandas • Matplotlib Statistical Learning & Data Visualisation Personality Prediction -Understanding K-nearest neighbour model Suggested Programs List
	DATA SCIENCES (Practical)	Python Packages Use Python libraries such as NumPy, Pandas, and Matplotlib for data analysis and visualization. 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.	<ul style="list-style-type: none"> <li>• Write a program to add the elements of the two lists.</li> <li>• Write a program to calculate mean, median and mode using Numpy</li> <li>• Write a program to display line chart from (2,5) to (9,10).</li> <li>• Write a program to display a scatter chart for the following points (2,5), (9,10),(8,3),(5,7),(6,18).</li> <li>• Read csv file saved in your system and display 10 rows.</li> <li>• Read csv file saved in your system and display its information</li> </ul>
December No.of working days-24	EMPLOYABILITY SKILLS	Unit 3: Information and Communication Technology Skills-II Unit 4: Entrepreneurial Skills-I Unit 5: Green Skills-I	Applications of CV ,Understanding CV Concepts <ul style="list-style-type: none"> <li>• Computer Vision Tasks - Basics of Images-Pixel, Resolution, Pixel value</li> <li>• Grayscale and RGB images</li> </ul> Activities: <ul style="list-style-type: none"> <li>• Game- Emoji Scavenger Hunt <a href="https://emojiscavengerhunt.withgoogle.com/">https://emojiscavengerhunt.withgoogle.com/</a></li> <li>• RGB Calculator: <a href="https://www.w3schools.com/colors/color_s_rgb.asp">https://www.w3schools.com/colors/color_s_rgb.asp</a></li> </ul>
	COMPUTER VISION	Introduction Define the concept of Computer Vision and understand its applications in various fields.  Concepts of Computer Vision Understand the basic concepts of image representation, feature extraction, object detection, and segmentation.	<ul style="list-style-type: none"> <li>• Create your own pixel art: <a href="http://www.piskelapp.com">www.piskelapp.com</a></li> <li>• Create your own convolutions: <a href="http://setosa.io/ev/image-kernels/">http://setosa.io/ev/image-kernels/</a></li> </ul>
	COMPUTER VISION (Practicals)	OpenCV Use Python libraries such as OpenCV for basic image processing and computer vision tasks.	<ul style="list-style-type: none"> <li>• Write a program to read an image and display using Python</li> <li>• Write a program to read an image and identify its shape using Python</li> </ul>
January No.of working days-13	Submission and assessment of the projects/ Prctical files		
February No.of working days-22	Annual Examination		

### Project Work / Field Visit / Student Portfolio

#### Suggested Projects/ Field Visit / Portfolio (any one activity to be one)

Sample Projects	<ol style="list-style-type: none"> <li>1. Student Marks Prediction Model</li> <li>2. CNN Model on Smoke and Fire Detection</li> </ol>
Field Work	Students' participation in the following- <ul style="list-style-type: none"> <li>• AI for Youth Bootcamp</li> <li>• AI Fests/ Exhibition</li> <li>• Participation in any AI training sessions</li> <li>• Virtual tours of companies using AI to get acquainted with real-life usage</li> </ul>
Student Portfolio	<ul style="list-style-type: none"> <li>• Maintaining a record of all AI activities</li> <li>• Hackathons</li> <li>• Competitions (CBSE/Interschool)</li> </ul> Note: Portfolio should contain minimum 5 activities