NAVY CHILDREN SCHOOL, MUMBAI
SPLIT- UP SYLLABUS FOR AY 2024-25
SUBJECT – ARTIFICIAL INTELLIGENCE (CODE- 417)
CLASS-X

Month	Periods for Teaching	Practical	Chapter	Detailed SplitUp Syllabus	Learning Outcomes	Practicals
April	**08**	**02**	**Part A– Employability Skills** **Part B – Subject Specific Skills**	**Part A - Employability Skills:** **Unit 1: Communication Skills:** Methods of communication, Verbal communication, Non-verbal communication, Communication Cycle and Importance of feedback, Barriers of effective communication, Writing Skills – Part of Speech, Writing Skills – Sentences **Part B – Subject Specific Skills** **Unit 1: Introduction to AI- Foundational Concepts of AI** What is intelligence? Decision Making, What is Artificial Intelligence and what is not? **Basics of AI: Let's Get started** Introduction to AI and related terminologies, Introducing AI, ML, & DL, Introduction to AI Domains (Data, CV & NLP), Gamified tools for each domain , Applications of AI, AI ethics	• Understanding of human communication theories related to culture, self-concept, perception, listening, verbal and nonverbal communication. • Learners will be able to prepare and deliver speeches effectively and participate in small group interactions. • Flip learning on Communication skill. • Understand the concept of human intelligence and its various components such as reasoning, problem-solving, and creativity. • Understand the concept of Artificial Intelligence (AI) and its domains • Learners to relate to application of Artificial Intelligence in their daily lives. • Learn about the ethical concerns involved in AI development, such as AI bias, data privacy and how they can be addressed.	**Activities suggested in CBSE study material** **Activity:**Gamified tools for each domain Data Sciences- Impact Filter (Impact of rise in temperature on different species) https://artsexperiments.withgoogle.com/impactfilter/ CV- Autodraw (It pairs machine learning with drawings from talented artists to help you draw stuff fast.) https://www.autodraw.com/ NLP- Wordtune (AI writing tool that rewrites, rephrases, and rewords your writing) https://www.wordtune.co

						m/ Moral Machine Activity : a platform for gathering a human perspective on moral decisions made by machine intelligence, such as self-driving cars. http://moralmachine.mit.edu/
May & June	**04**	**-**	**Part A– Employability Skills**	**Part A - Employability Skills:** **Unit 2: Self Management Skills** • Stress Management • Self-awareness-Strength and Weakness Analysis • Self-motivation • Self-regulation—Goal Setting and Time Management **Unit 3: ICT Skills** • Basic Computer Operations • Performing Basic File Operations • Computer Care and Maintenance • Computer Security and Privacy	• Students will learn about personal stressors and understand how they affecton their physical, mental, emotional, and spiritual well-being. Practicing mindfulness and self-reflection can enhance self-awareness in managing stress effectively. • Students will learn how to Set SMART goals based on self-analysis helps in achieving personal and professional success	

July	**06**	**02**	**Part B – Subject Specific Skills** **Part–C Practical Work**	**Part B – Subject Specific Skills** **Unit 2 : AI Project Cycle** **Introduction:** Introduction to AI Project Cycle • Problem Scoping • Understanding problem scoping and Sustainable Development Goal • Data Acquisition • Data Exploration • Visualizing Data • Modelling • Introduction to Rule Based & Learning Based AI Approaches • Evaluation **Unit 3 – Advance Python (To be assessed through practicals)** **Recap –** • Jupyter Notebook • Introduction to Python • Python Basics	• Identify the AI Project Cycle framework. • Learn problem scoping and ways to set goals for an AI project. • Identify data requirements and find reliable sources to obtain relevant data • Know various data exploration techniques and its importance • Know about the different machine learning algorithms used to train AI models • Understand, create and implement the concept of Decision Trees. • Know the importance of evaluation and various metrics available for evaluation • Understand to work with Jupyter Notebook, installing Python Packages. • Able to write basic Python programs using fundamental concepts such as variables, data types, operators, and control structures.	**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**(Optional)**** Neural Networks Jupyter Notebook, Introduction to Python, Python Basics

Aug	**06**	**03**	**Part–B Subject Specific Skills** **Part–C Practical Work**	**Part B – Subject Specific Skills** **Unit 4: Data Sciences (Theory)** Introduction to Data Science, Applications of Data Science, Revisiting AI Project Cycle, Data Collection, Data Access **Python Packages(Practical)** Python data Sciences (Numpy, Pandas, Matplotlib), Statistics Learning & Data Visualization (Statistics and Standard Deviation) **K-nearest neighbour model (Optional)**** Personality Prediction, Understanding K-nearest neighbour model	• Define the concept of Data Science and understand its applications in various fields. • Understand the basic concepts of data acquisition, visualization, and exploration. • Use Python libraries such as NumPy, Pandas, and Matplotlib for data analysis and visualization.	Revisiting AI Project Cycle, Data Collection, Data Access Activities: Game: Rock, Paper & Scissors https://next.rockpaperscissors.ai/ Python for Data Sciences • Numpy • Pandas • Matplotlib
Sep	**06**	**02**	**Part–B Subject Specific Skills** **Part–C Practical Work** **Part A– Employability Skills**	**Part B – Subject Specific Skills** **Unit 5 – Computer Vision (Theory)** Introduction to Computer Vision, Applications of CV, Understanding CV Concepts (Computer Vision Tasks, Basics of Images-Pixel, Resolution, Pixel value, Grayscale and RGB images) **Open CV (Practical)** Introduction to Open CV, Image Processing **Part A - Employability Skills:** **Unit 4: Entrepreneurial Skills** Entrepreneurship and Society, Qualities	• Define the concept of Computer Vision and understand its applications in various fields. • Understand the basic concepts of image representation, feature extraction, object detection, and segmentation. • Use Python libraries such as OpenCV for basic image processing and computer vision tasks. • Flip learning by students on the Entrepreneurial skills	**Activities:** Game- Emoji Scavenger Hunt https://emojiscavengerhunt.withgoogle.com/ RGBCalculator: https://www.w3schools.com/colors/colors_rgb.asp Create your own pixel art: https://www.piskelapp.com/ Create your own convolutions: https://setosa.io/ev/image-kernels/

				and Functions of an Entrepreneur Myths about Entrepreneurship, Entrepreneurship as a Career Option Convolution Operator **(Optional)**** Convolution Neural Network (Optional)**		
Oct	**02**	**-**	**Part A– Employability Skills** **Part–B Subject Specific Skills**	**Part A - Employability Skills:** **Unit 5: Green Skills** • Sustainable Development • Our Role in Sustainable Development **Part B – Subject Specific Skills** **Unit 6: Natural Language Processing** Introduction to Natural Language Processing, NLP Applications, Chatbots	• Flip learning by students on the Entrepreneurial skills • Understand the concept of Natural Language Processing (NLP) and its importance in the field of Artificial Intelligence (AI)	

Nov	**06**	**01**	**Part–B Subject Specific Skills**	Human Language VS Computer Language, Text Processing, Data Processing, Bag of Words TFIDF**(Optional)****, NLTK**(Optional)**** **Part B – Subject Specific Skills** **Unit 7: Evaluation** • Introduction to model evaluation • Confusion Matrix • Understanding Accuracy Precision, Recall & F1 Score • Practice Evaluation	• Explore the various applications of NLP in everyday life, such as chatbots, sentiment analysis, and automatic summarization. • Learn about the Text Normalization technique used in NLP and popular NLP model - Bag-of-Words • Understand Different types of Evaluation techniques Underfit, Perfect Fit, OverFit • Model Evaluation Terminologies-The Scenario - Prediction, Reality, True Positive, True Negative, False Positive, False Negative Confusion Matrix, Learn to make a confusion matrix for given Scenario • Learn about the different types of evaluation techniques in AI, such as Accuracy, Precision, Recall and F1 Score, and their significance.	**Activity:** Based on Confusion Matrix, Practice Evaluation
Dec	**04**		**Revision for Pre-Board Examination**			

****NOTE: Optional components shall not be assessed. They are for extra knowledge**