



TAGORE INTERNATIONAL SCHOOL

EAST OF KAILASH, NEW DELHI

Robotics Class 7

Month	Topic / Subtopic	Learning Outcomes	Pedagogy/ Methodology	Instructional Aids /Teaching Tools & Resources	Activities / Projects	Assessment
April & May	Artificial Intelligence - AI Introduction - AI Real world examples - AI Advantages & disadvantages - AI applications Programming Python: - Introduction of Python - Type of IDE - Why Python is Important? - Installation of Python - Application of Python Variables: - Introduction of Variables - Rules of Writing Variables - How to Store Values in Variables Data Types: - Introduction Data types - Explain Data type - Float Data type Sequence Data Type: - List - Tuple - Set	- Understand AI concepts, real-life applications, advantages, disadvantages, and future scope. - Basics of Python, IDEs, importance, applications, and installation. - Understand variables, naming rules, and storing values. - Identify data types and differentiate list, tuple, set.	- Explanation using real-life examples, videos, and discussion-based learning - Demonstration of Python setup, guided coding, and hands-on practice - Concept explanation with examples and small coding activities - Interactive explanation with examples and practice exercises		"Math Riddles" "Chat Bot"	

July	Introduction of Robotics - History & Laws of Robotics - Future Scope of learning - Industrial applications - Domestic applications - Commercial applications Introduction of Tinkercad Microprocessor & Microcontroller Arduino Programming - Basic Structure and Commands - Functions And Variables - Conditional and Controlled Instructions - Arithmetic and logical instructions - Programming Mapping Data Type: - Introduction of Dictionary - How to add Key and Values in Dictionary - How to add and remove data Function: - Introduction - In-build Function	- Understand robotics concepts, applications, and future scope. - Understand structure, functions, and basic programming logic. - Understand key-value pairs and operations. - Understand built-in and user-defined	- Demonstration, videos, and discussion on real-world applications - Coding demonstration, and hands-on circuit building - Example-based teaching and small coding tasks	Hardware : Led's Breadboard Jumper wires Arduino Uno Microcontroller board 9v battery Battery connector Programming cable Software: Arduino IDE	"LED Patterns" "Rock Paper Scissors Game"	
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August & September	• User define Function Arithmetic operator: • Introduction Arithmetic Operator • Comparison Operator Conditional Statement: • Introduction • If Statement • Else Statement Loops Concepts : • Introduction • While loop • For loop Soil Moisture Sensor • Working principal • Interfacing concept • Programming • Model making Smart plant take-care system • Working concept • Project discussion • Programming • Project Testing Libraries • Introduction of Libraries • Python Libraries and Framework	functions. • Perform operations and apply in problem-solving. • Apply if-else for decision making. • Use for and while loops for repetition. • Understand working and interfacing soil moisture sensor. • Apply automation and programming concepts. • Understand libraries and	• Problem-solving activities and coding exercises • Real-life problem discussion and coding practice • Demonstration and hands-on circuit building Coding. • Project-based learning and group activity	Hardware : Led's Jumper wires Arduino Uno Microcontroller board 9v battery Battery connector Programming cable Soil moisture sensor Software: Arduino IDE	• “ Smart Calculator” • “Number Guessing quiz” • “Multiplication Quiz” • “Smart Plant take-care System	
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October & November	• Uses of Libraries in Python Libraries Installation • What is pip? • Installation of Pandas • Installaiton of Numpy Introduction of Pandas : • What is Pandas • Why Pandas is used in Python • Basic components (Series and Data Frame) Introduction of Numpy : • What is NumPy • Purpose of using NumPy in Python • Understanding arrays in NumPy • Difference between lists and NumPy arrays Introduction of Ultrasonic Sensor • Introduction • Working Principal • Pin Description • Hardware Interfacing • Programming Concept	installation using pip. • Work with DataFrames and perform operations. • Perform array operations and understand arrays. • Understand distance measurement and interfacing.	• Demonstration of installation and guided practice • Data handling demonstration and hands-on activities • Practical coding examples and exercises • Demonstration, circuit building, and testing	Hardware : Led's Breadboard Jumper wires Arduino Uno Microcontroller board 9v battery Battery connector Programming cable Ultrasonic sensor Software: Arduino IDE	• “Numerical Computing” by different methods	
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December	Introduction of Clustering with Google Sheets: • What is Clustering • Purpose of using clustering in data analysis • Understanding grouping of similar data • Performing basic clustering using formulas (IF function) • Types of grouping (Low, Medium, High categories) • Difference between manual clustering and automatic clustering Introduction of Google Sheets (Data Visualization): • What is Google Sheets • Purpose of using Google Sheets for data handling • Understanding data visualization in spreadsheets • Types of charts (bar chart, pie chart, line chart) • Basic components of a chart (title, axis, labels, legend) • Difference between raw data and visual representation	• Understand grouping and clustering of data. • Create charts and visualize data.	• Activity-based learning using sample datasets • Hands-on practice for creating charts and graphs		• “Clustering and Classification Data ” • “Data Visualization using Matplotlib”	
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January & February	Introduction of Matplotlib: • What is Matplotlib • Purpose of using Matplotlib in Python • Understanding data visualization • Types of graphs (line, bar, pie, scatter) • Basic components of a graph (title, labels, legend) • Difference between text data and visual data representation Introduction of Obstacle Avoiding Robot: • What is an Obstacle Avoiding Robot • Working principle of the robot • Components used • Role of programming movement • Real-life applications (self-driving cars, robotics, automation systems) • Difference between manual control and automatic robots	• Create graphs and visualize data. • Understand robot working and real-life applications.	• Project-based learning with hands-on robot building	Hardware : Arduino Uno Microcontroller board Ultrasonic sensor 9v battery Bread board Battery connector Programming cable Software: Arduino IDE	• “Smart Sonar Radar System / Obstacle Avoiding”	
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