

Lecture Name

Detailed concepts

"Programming Fundamentals - 1 (JavaScript)"

1	Introduction to Javascript	Features of JS, Variables. Constants, Input/Output, Data Types, Simple Operators & Operands
2	Operators	Different types of operators, Assignment, Arithmetic operators, Comparison & Logical Operators, Bitwise Operators
3	Conditional Statements	Understanding conditional constructs, IF, IF-else, Nested IFs. switch
4	Loops	Understanding loops with for, while/do-while, break, continue
5	Data Structures	Introduction to DS, Strings & Arrays
6	Data Structures	Stack and Queue
7	Functions	Types of Functions (User Defined / Built-in Functions), Function Definition, Function Calls, Passing Arguments, Returning Values."
8	The Quizzard - 1	Quiz game based on all the concepts covered so far

"Programming Fundamentals - 2 (JavaScript)"

9	Introduction to Object Oriented Programming	OOPS, Class, Objects, few methods and properties with implementation.
10	Objects	Objects types, object methods, mutable, new keyword, object methods.
11	Event Handling	Event handling in JavaScript. Onclick, onload, onchange, onmouseover, onmouseout, onkeydown, onload
12	The Quizzard - 2	Quiz game based on all the concepts covered so far.

Web Development

13	Intorudction to HTML	Introduction to HTML and Demonstration of various html tags with suitable examples
14	HTML with CSS	Introduction to CSS, Inline, Internal, External, CSS Selectors and Box Model (Content, Padding, Border, Margin)
15	More about CSS	Backgrounds, Opactiy, and different types of positioning (Static, Absolute, Relative, Fixed)

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"Programming Fundamentals - 1 (JavaScript)"

16 Planet Earth

Creating an animated planet earth webpage.

17 Digital Clock

Creating a digital clock

"Games Development - 1"

18 Big Fact Hunt

Basic HTML-CSS-JS webpage with Javascript Quiz Game

19 Big Fact Hunt

Project Continued.

20 Finding Nemo

Accessing elements, Responding to a Click, Changing Website Content

21 Finding Nemo

Accessing elements, Responding to a Click, Changing Website Content

22 The Drum Kit

Drumkit project

23 The Drum Kit

Project continued.

API - 1

24 Book Information App using Google Book API

Book Information App using Google Book API

25 Bot Development (BotUI Javascript Framework)

Implementation of bot with various features using BotUI framework of JavaScript

Artificial Intelligence- 1

26 Introduction to Artificial Intelligence

Introduction to AI, Machine Learning, Deep Learning, Natural Language Processing with real time examples and showcasing through games

27 Sentiment Analysis (P5.js & ml5.js)

Sentiment Analysis of Movie Reviews using P5.js & ML5.js

28 Snake Game - 1

Implementing Snake Game using P5.js and teachable machine

29 Snake Game - 2

Game Continued

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App Development

30	Introduction to Thinkable	Introduction to thinkable platform
31	web app	Making the web app using thinkable
32	Tic Tac Toe Part-1	Making the tic tac toe game using thinkable (design)
33	Tic Tac Toe Part-2	Making the tic tac toe game using thinkable (coding)
34	Smart App Part 1	Making the smart app using thinkable (design)
35	Smart App Part 2	Making the smart app using thinkable (coding)
36	Chat App Part-1	Making the chat app using thinkable (design)
37	Chat App Part-2	Making the chat app using thinkable(coding)
38	FINAL PROJECT	Create a final project in thinkable
39	FINAL PROJECT	Publish the app to Play Store

"Programming Fundamentals - 1 (Python)"

40	Introduction to Python	Features of Python, Variables, Constants, Input/Output, Data Types
41	Operators	Different types of operators, Arithmetic, Assignment, Comparison & Logical Operators, identity, membership and bitwise operators
42	Conditional Statements	Understanding conditional constructs, IF, IF-else, Nested IFs.
43	Loops	Understanding loops with for, while, break, continue. Usage of range function and in operator with loops.
44	File Handling	Introduction to Files, Read/Write operations with file handling.

"Programming Fundamentals - 2 (Python)"

Lecture Name

Detailed concepts

45 **Data Structures**

Introduction to DS, Lists and Tuples with various inbuilt and user defined functions

46 **Data Structures**

Dictionaries and String with various inbuilt and user defined functions. Overview of Stack, Queue, Tree, Hash etc.

47 **Functions**

Types of Functions (User Defined / Built-in Functions), Function Definition, Function Calls, Passing Arguments, Returning Values.

48 **Introduction to Object Oriented Programming**

OOPS in Python. Class, Objects, few methods and properties with implementation

49 **Exception Handling**

Understanding exceptions with try and except. Inbuilt and user-defined exceptions

50 **CV Builder**

CV Builder based on all the concepts covered so far

51 **CV Builder**

CV Builder based on all the concepts covered so far

Game Development - 2

52 **Pong Game**

Ping Pong game using Turtle Library

53 **Cannon Game**

Cannon Game using Turtle Library

API - 2

54 **Weather Detector App**

Understanding OpenWeatherAPIs, creating a token identifier. Exporting necessary packages, creating a simple weather app

Artificial Intelligence - 2

55 **NLP based Chatbot**

NLP based Chat Bot using Python NLTK library

Data Analysis

56 **Introduction to Data Analysis**

Introduction to Data Analysis and use cases. Installing Python and introducing Google Collab

57 **Numpy - 1**

"Introduction to numpy, Installing and Importing. Difference between a Python list and a NumPy array?, Creating and Accessing array, Adding, removing, and sorting elements"

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58 Numpy - 2

"Reshaping an Array. Converting a 1D array into a 2D array. Indexing & Slicing. Creating matrices. Generating random numbers. Transposing and reshaping a matrix. Working with mathematical formulas"

59 Pandas - 1

"Setting Up Your Environment Using the Pandas Python Library Getting to Know Your Data Displaying Data Types Showing Basics Statistics Exploring Your Dataset Getting to Know Pandas' Data Structures Understanding Series Objects Understanding DataFrame Objects"

60 Pandas - 2

"Accessing Series Elements Using the Indexing Operator Using .loc and .iloc Accessing DataFrame Elements Using the Indexing Operator Using .loc and .iloc Querying Your Dataset Grouping and Aggregating Your Data"

61 Pandas - 3

"Manipulating Columns Specifying Data Types Cleaning Data Missing Values Invalid Values Inconsistent Values Combining Multiple Datasets"

62 Data Visualization with MatPlotLib

"Introduction to Matplotlib, Object Hierarchy, Understanding plt.subplots() Notation, Plotting in Pandas "

63 Data Visualization with SeaBorn

"Seaborn vs Matplotlib, To Load Data To Construct Seaborn Plots, Loading A Built-in Data Set, Loading Your Pandas DataFrame, To Show Seaborn Plots, To Use Seaborn With Matplotlib Defaults, To Use Seaborn's Colors As A colormap in Matplotlib?, To Scale Seaborn Plots For Other Context, To Temporarily Set The Plot Style, To Set The Figure Size in Seaborn, To Rotate Label Text, To Set xlim or ylim in Seaborn, To Set Log Scale, To Add A Title"

64 Gradebook

Make a Gradebook

65 Gradebook

Make a Gradebook

Database

66 Introduction to DBMS

Introduction to Databases, Database Tools, Creating, Inserting, Updating and accessing the data using database tools

67 SQL

Introduction to SQL, Introduction to DDL and DML statements. Command based and GUI based database operations

68 DDL/DML

DML with commands, SQL Operators and real time scenarios using SQL queries

69 Constraints

Constraints in SQL with NOT NULL, CHECK, UNIQUE, DEFAULT, PRIMARY KEYS, FOREIGN KEYS

70 Keys

More about keys using Primary Key, Foreign Key, Super Keys, Composite Keys etc with implementation

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71 Joins

Introduction to JOINS. Inner Join, Left outer join and right outer joins with examples

AR/VR

72 AR

Introduction to Augmented Reality with simple project implementation

73 VR

Introduction to Virtual Reality with simple project implementation

74 PROJECT ON VR

Create a project on AR/VR.

75 PROJECT ON VR

Project Continued.

ROBOTICS

76 Introduction to Arduino Programming

"Structure of Arduino Program, setup, loop, Variables, Constants, Keywords, Datatypes, Separators, Header files and Comments."

77 Loops and Conditional

"Loops – while and for loop. Conditional – If, If else, nested if"

78 Hardware Devices

"Breadboard, Resistors, Pins - Understanding Digital and Analog Pins. Reading Data from Digital Pins, Writing Data to Digital Pins, DigitalRead(), DigitalWrite(), Setting up pins using pinMode()."

79 Input / Ouput

"Input and Ouput – Taking Input from the user, displaying the results, using Serial. Delaying the response using delay(). Writing simple Arduino Programs (LED Blink), Upload Sketch, Compile Sketch."

80 Traffic Signal System

Arduino based project with traffic light simulation