

## **Vacation Programme for Students in Python, AI and Soft Skills**

<b>Duration</b>	:	90 Hrs
<b>Timing</b>	:	10 AM to 1 PM
<b>Eligibility</b>	:	Graduates with Programming Knowledge
<b>Fee</b>	:	Rs. 3000/-
<b>Syllabus</b>	:	

### **Introduction**

Block diagram - Functional units – Hardware – Software - Concept of Binary number system - Types of computers – Desktop, Server, Laptop, Palmtop, Concept of machine, assembly & high level languages, Over view of the basic components – CPU- Keyboard – Mouse – Display – RAM & ROM–Secondary Storage devices- Operating System - Boot strapping - POST - purpose of OS

### **Working with Operating System (Windows)**

Familiarisation of Windows Desktop, Folder & File manipulation, Understanding file formats, Windows utilities-Notepad, Paint, CD/DVD Burning, Working with Sound and movie files-Sound recorder-playing movie and audio files, Transferring files through USB using HDD/Flash drives/Memory cards/Smart phones, User Account creation, Power options-Installing and removing programs – Device manager-Installing and using printer-Virus protection – Firewall – Malware-Adware-Spyware – Disk Maintenance- Defrag

### **Python programming**

Introduction to Python, Features of Python, executing a simple “hello world” program, execution modes: interactive mode and script mode, Python character set, Python tokens( keyword, identifier, literal, operator, punctuator), variables, concept of l-value and r-value, use of comments

Knowledge of data types: Number(integer, floating point, complex), boolean, sequence(string, list, tuple), None, Mapping(dictionary), mutable and immutable data types, Operators: arithmetic operators, relational operators, logical operators, assignment operators, augmented assignment operators, identity operators (is, is not), membership operators (in not in), Expressions, statement, type conversion, and input/output: precedence of operators, expression, evaluation of an expression, type-conversion (explicit and implicit conversion), accepting data as input from the console and displaying output, Errors- syntax errors, logical errors, and run-time errors

Flow of Control: introduction, use of indentation, sequential flow, conditional and iterative flow, Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number, Iterative Statement: for loop, range(), while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number, etc.

Object Oriented Python: Classes in Python, Principles of Object Orientation, Creating Classes, Inheritance, Polymorphism, Type Identification, Custom Exception, Classes, Iterators, Generators and Decorators

Introduction to Data Science: Basics of Data Science, Python Ecosystem for Data Science, Getting started with Anaconda and Jupyter, Pandas, Matplotlib, Numpy

Exploratory Data Analysis: Data collection, Missing value analysis, Data wrangling, Data Visualization

## **Artificial Intelligence**

What is AI?, Types of Artificial Intelligence, Applications and Examples of AI

Introduction to Generative AI, What is Generative AI • Brief history and evolution, Benefits and application Generative AI Generative AI tools,

AI in text generation, Text generation tools. \*(ChatGPT, Bing Chat and Bard), Document preparation, Summarize articles, \*(Grammarly, Quilbot ),

Image Generation tools - \*(Clipdrop, Firefly, DALL·E2, Midjourney),

Music Generation tools - \*(Jukebox, AIVA, and Beatoven), Art generator – \*(Jasper Art, Nightcafe)

Video generation tools – \*(invideo, lumen5) • \*(models.ai4bharat.org) • Code Generation tools - \*(OpenAI Codex)

## **English Communication & Soft Skills**

Communication Skills- Basic English Grammar, Non-Verbal-body language-gestures-postures-voice modulation, Vocabulary Building and Vocabulary Building Activities, Pronunciation(accent neutralization), Non-verbal-Debate-Paraphrasing-Discussion-Role play-Extempore-Public speaking

Report Writing-Creative Writing, Email Writing, Notices & Advertisements, Group Dynamics-Team building, Test anxiety, Enhancing academic performance, Time management, Positive Attitude, Self Esteem

## **Career Guidance**

How to choose right career options, Various job related professional courses in India and Abroad, Various other courses and higher education options in India and Abroad