SYLLABUS OF PYTHON

Hour 1: Quick Python Revision

- Quick recap: variables, if-else, loops, functions, lists, dictionaries
- **Activity**: Write a Python program that takes a user's name, age, and calculates their birth year

Hour 2: Advanced List and Dictionary Operations

- List slicing, comprehension
- Dictionary methods, nested structures
- **Activity**: Create a student data structure with name, marks, and subject-wise records

Hour 3: Functions with Default & Keyword Arguments

- Positional vs keyword arguments
- Default values, return types
- **Activity**: Function to calculate net salary from basic pay, tax, bonus

Hour 4: Lambda, Map, Filter, Reduce

- Anonymous functions, functional programming

- **Activity**: Use map to square numbers, filter to find even numbers

Hour 5: File Handling – Text and CSV

- Reading & writing `.txt` and `.csv`
- File modes: r, w, a
- **Activity**: Read marks from CSV and write grade report to text file

Hour 6: Error & Exception Handling

- try, except, finally, raising errors
- **Activity**: Create a basic login program with error handling for wrong input

Hour 7: Python Modules and Packages

- Importing custom and built-in modules
- `math`, `random`, `datetime`, `os`
- **Activity**: Build a random password generator using the random module

Hour 8: Object-Oriented Programming – Classes & Objects

- What is OOP, defining classes
- Creating objects and using methods
- **Activity**: Create a class for LibraryBook with details like title, author, status

Hour 9: Inheritance and Encapsulation

- Inheriting parent classes, access modifiers
- **Activity**: Create a base class `Employee` and child class `Manager`

Hour 10: Working with JSON

- Import `json`, convert dict to JSON and vice versa
- **Activity**: Convert a Python dictionary (user data) into JSON and save it

Hour 11: Working with Date and Time

- datetime module basics, current date, formatting
- **Activity**: Build a reminder tool that calculates days left for an event

Hour 12: Intro to Python Libraries

- Introduction to `pandas`, `matplotlib`, `requests` (theory + small demo)
- **Activity**: Use `pandas` to load a CSV file and print basic summary

Hour 13: Simple Web Scraping with `requests` & `BeautifulSoup`

- Making web requests and parsing HTML
- **Activity**: Scrape titles of articles from a website like TOI or Hacker News

Hour 14: Intro to APIs

- What is an API, using APIs with Python
- **Activity**: Fetch weather data using a public API

Hour 15: File & Folder Automation with `os` and `shutil`

- Automate file/folder creation, renaming, deletion
- **Activity**: Write a script to organize files into folders by type

Hour 16: Debugging and Best Practices

- Writing clean code, comments, using `pdb`
- **Activity**: Debug a broken Python script and fix the errors

Hour 17: Working with Excel

- Reading/writing Excel files
- **Activity**: Write a program that updates marks in an Excel file

Hour 18: Final Project Planning

- Guide them to choose a mini-project idea
- Break it down into steps and assign modules

Hour 19: Project Building

- Interns develop their individual/team projects
- Trainer helps troubleshoot issues and refine code

Hour 20: Project Presentation & Feedback

- Interns present projects to peers/mentor
- Trainer provides feedback, corrections, and certificate distribution