05 days session on Basic and advanced Python - A Practical Approach From 17th March - 21st March 2025 @ GLA

Day 1

Unit 1. GUI Programming with Python

Forenoon Session

- Introduction to GUI frameworks
- GUI frameworks: Tkinter, PyQt, Kivy
- Event-driven programming

Afternoon Session

- Creating multi-threaded GUI apps
- Integrating GUI with databases and APIs
- Packaging and distributing desktop applications

Hands-On Exercises:

1. Build a **basic GUI calculator** using Tkinter.
2. Create a **file manager with PyQt** to browse, rename, and delete files.
3. Develop a **to-do list app** with SQLite database integration.

Capstone Project:

Desktop Inventory Management System – A full-fledged inventory app with search, add, delete, and export functionalities, using PyQt and SQLite.

Day 2

Unit 2. Network Programming with Python

Forenoon Session

- Introduction to Network Programming
- Socket programming (TCP/UDP communication)
- Building client-server applications

Afternoon Session

- HTTP requests and web scraping
- Automating network tasks with Python
- Using WebSockets for real-time communication

Hands-On Exercises:

1. Develop a **simple chat application** using Python sockets.
2. Create a **web scraper** to extract real-time data from news websites.
3. Build a **port scanner** to check open ports on a given host.

Capstone Project:

Real-Time Network Monitoring Tool – A Python-based tool to monitor network traffic, detect anomalies, and log suspicious activities.

Day 3

Unit 3. Cybersecurity & Ethical Hacking with Python

Forenoon Session

- Introduction to Cybersecurity
- Packet sniffing and network security analysis
- Web security: SQL injection, XSS detection

Afternoon Session

- Password cracking with brute force and hashing
- Writing exploits and penetration testing scripts
- Cryptography (AES, RSA encryption)

Hands-On Exercises:

1. Write a **packet sniffer** using Scapy to capture network traffic.
2. Implement a **brute-force password cracker** for ZIP or SSH login.
3. Develop a **simple keylogger** for ethical testing.

Capstone Project:

Automated Vulnerability Scanner – A Python-based tool that scans web applications for SQL injection, XSS, and security misconfigurations.

Day 4

Unit 4. Machine Learning & AI Automation with Python

Forenoon Session

- Introduction to AI Automation
- Automating ML workflows with Python
- Training and deploying ML models

Afternoon Session

- AI-based automation (chatbots, recommendation systems)
- Using TensorFlow, PyTorch, and Scikit-learn
- Deploying AI models using Flask or FastAPI

Hands-On Exercises:

1. Train a **spam detection model** and deploy it as an API.
2. Develop a **real-time chatbot** using NLP and OpenAI's GPT API.
3. Build an **AI-powered resume screener** for job applications.

Capstone Project:

AI-Powered Customer Support Chatbot – A Python-based chatbot that uses NLP and deep learning to provide automated customer support.

Day 5

Unit 5. Advanced Web Development with Python (FastAPI & Flask)

Forenoon Session

- Introduction to Web Services
- Web frameworks: Flask vs. FastAPI
- RESTful API development

Afternoon Session

- Authentication & security (JWT, OAuth)
- WebSockets for real-time applications
- Asynchronous APIs with FastAPI

Hands-On Exercises:

1. Create a **CRUD API** with FastAPI to manage user data.
2. Implement **JWT authentication** in a Flask web app.
3. Build a **real-time chat application** using WebSockets in FastAPI.

Capstone Project:

AI-Powered Resume Screening API – A Python-based REST API that receives resumes, extracts key skills, and scores candidates using an AI model.