Magna Skills Development Institute

Corporate Training Courses
Virtual Online Classes
Conferences & Webinars
Academic Tours

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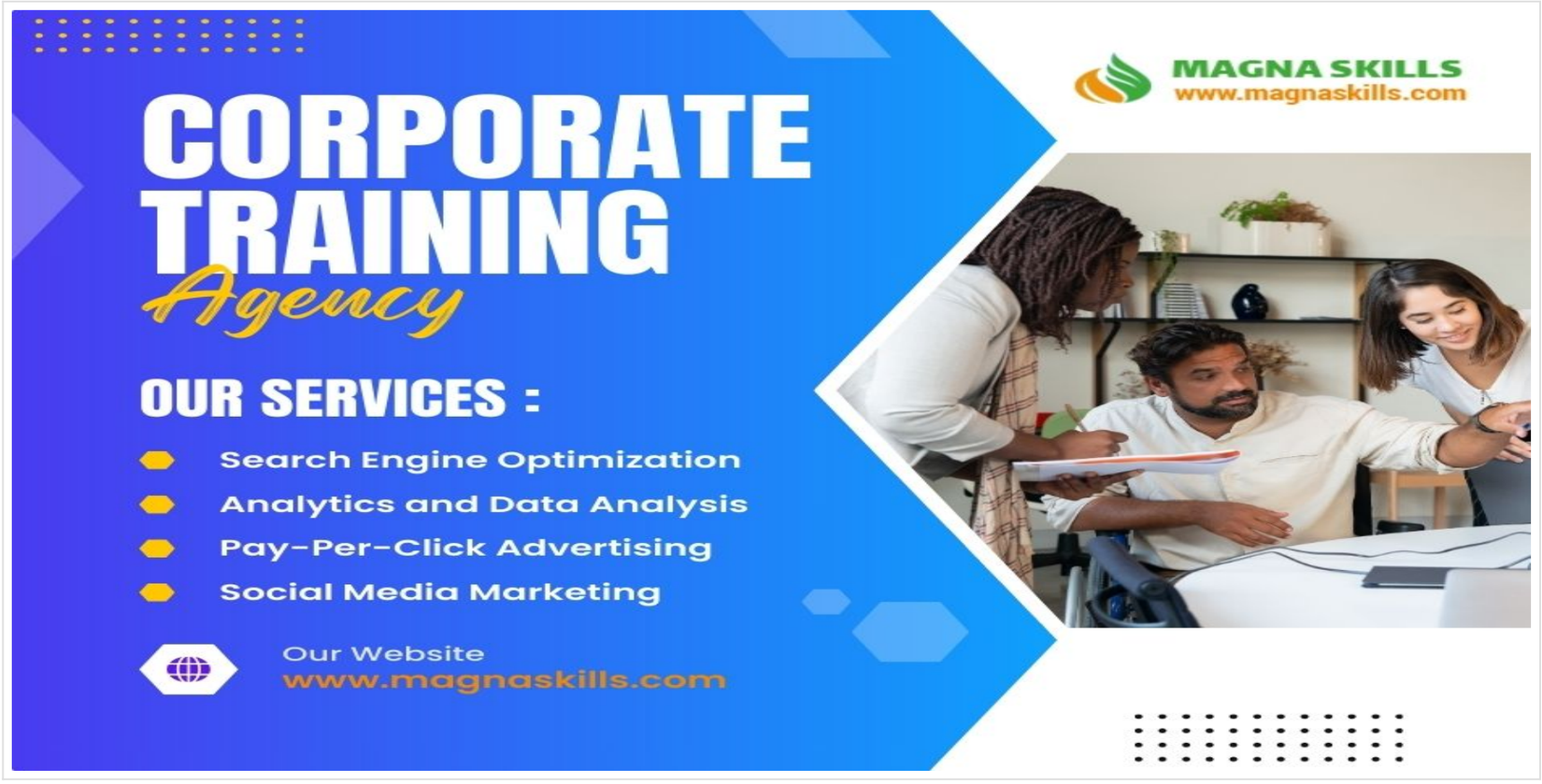
Advanced Python Programming Course Details

Department: ICT and Security Management

Presented by Magna Skills Development Institute

Date Created: 15-May-2025

Training Coordinator: Denis Wunganayi



Course Summary

The Advanced Python Programming course offered by Magna Skills is designed for experienced Python developers who want to deepen their understanding and proficiency in the language. This course covers advanced topics, best practices, and techniques for leveraging Python's powerful features to develop complex applications, solve challenging problems, and optimize performance.

Course Objectives

1. **Advanced Language Features:** Explore advanced Python language features such as generators, decorators, context managers, and metaprogramming techniques to write more concise, efficient, and expressive code.
2. **Concurrency and Parallelism:** Learn how to leverage Python's concurrency and parallelism capabilities using libraries like asyncio, threading, and multiprocessing to develop scalable and high-performance applications.
3. **Advanced Data Structures and Algorithms:** Dive into advanced data structures and algorithms implemented in Python, including graph algorithms, dynamic programming, and advanced sorting and searching techniques.
4. **Pythonic Design Patterns:** Understand Pythonic design patterns and idiomatic approaches to software design, including object-oriented design patterns, functional programming concepts, and code organization principles.
5. **Performance Optimization:** Discover strategies for optimizing Python code performance, including profiling, code optimization techniques, and leveraging C extensions and libraries for computationally intensive tasks.

Course Outline

Module 1: Advanced Language Features

- Generators and iterators
- Decorators and context managers
- Metaprogramming with metaclasses

Module 2: Concurrency and Parallelism

- Asynchronous programming with asyncio
- Multithreading and multiprocessing
- Parallel computing with concurrent.futures

Module 3: Advanced Data Structures and Algorithms

- Graph algorithms and network analysis
- Dynamic programming and memoization
- Advanced sorting and searching techniques

Module 4: Pythonic Design Patterns

- Object-oriented design patterns (e.g., Singleton, Factory)
- Functional programming concepts (e.g., map, filter, reduce)
- Design patterns for clean and maintainable code

Module 5: Performance Optimization

- Profiling and benchmarking Python code
- Optimization techniques (e.g., memoization, vectorization)
- Using C extensions and libraries for performance-critical tasks

Module 6: Advanced Libraries and Frameworks

- Deep learning with TensorFlow or PyTorch
- Web development with Django or Flask
- Data science with pandas, NumPy, and scikit-learn

Module 7: Testing and Debugging

- Unit testing and test-driven development (TDD)
- Debugging techniques and tools (e.g., pdb, logging)
- Continuous integration and automated testing pipelines

Module 8: Deployment and Scalability

- Packaging and distributing Python applications
- Containerization with Docker
- Scalability considerations for distributed systems

Module 9: Security and Best Practices

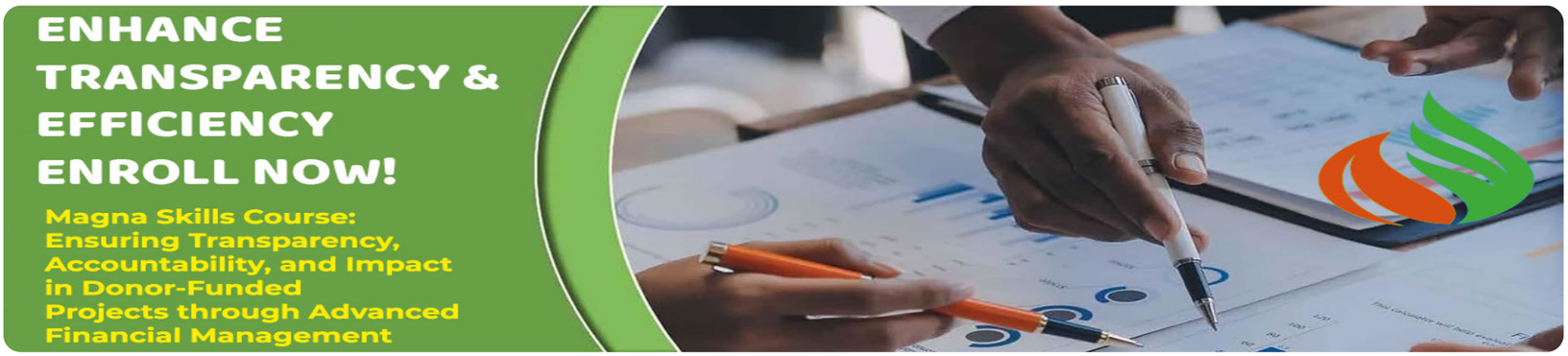
- Secure coding practices and vulnerabilities
- Handling sensitive data and encryption

- Compliance with industry standards and regulations

Module 10: Real-world Applications and Case Studies

- Building complex applications and systems using advanced Python techniques
- Analyzing real-world case studies and examples of Python in action

The Advanced Python Programming course equips experienced Python developers with the knowledge and skills to tackle complex challenges, optimize performance, and develop high-quality applications using Python. Through a combination of in-depth theoretical learning, hands-on exercises, code reviews, and real-world applications, participants will gain the expertise needed to become proficient Python developers capable of building scalable, maintainable, and efficient software solutions



Company Overview

Who We Are: Magna Skills is a premier training and capacity-building organization specializing in professional development for government institutions, NGOs, and the private sector.

Our Mission: To provide world-class training solutions that equip professionals with the expertise needed to excel in their careers and contribute meaningfully to their organizations.

Our Vision: To be the leading provider of professional training and development across Africa, fostering excellence, innovation, and capacity-building in public and private sectors.

Core Values

- **Excellence** – Delivering high-quality training tailored to meet the evolving needs of professionals.
- **Integrity** – Upholding the highest ethical standards in all our engagements.
- **Innovation** – Embracing new technologies and methodologies to enhance learning experiences.
- **Customer-Centric Approach** – Ensuring client satisfaction by providing relevant, practical, and impactful training.

- **Collaboration** – Partnering with industry experts and institutions to provide the best learning opportunities.

Our Training Methodology

We use a blended learning approach that includes instructor-led training, case studies, workshops, and post-training support.

Why Choose Magna Skills?

- Experienced Trainers
- Customized Training Solutions
- Interactive Learning
- Global Recognition
- Proven Track Record

Request for Training Form

Complete the form and share with Magna Skills Support Team on email info@magnaskills.com or Send Whatsapp on: +27630079022

Approval & Authorization	
Applicant Details	**Course Details**
First Name:	Course Name:
Last Name:	Training Venue:
Mobile:	Month:
Email:	Training Method: Onine[____] Face to Face [___]
Company Name:	Duration:
Country:	Number of Staff Members:

By signing this agreement, both parties confirm their commitment to the terms outlined in this proposal.