MAGNA SKILLS DEVELOPMENT INSTITUTE

Capacity Building • Professional Training • Organisational Development

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Course Profile Document

ICT and Security Management

Advanced Python Programming

Prepared as a professional course profile for delegate review, sponsorship approval and organisational training planning.

COURSE CODE	DELIVERY	DURATION	PREPARED FOR
MSD2841	**Online / Face-to-Face**	**Flexible**	**Organisation Approval**

Register for this Course

View Online Course Page

Course Overview

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 Outcomes

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 / Curriculum

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
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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

Target Audience

Microsoft PowerPoint

Key Course Benefits

Work-Ready Skills

Delegates leave with practical tools, templates and methods they can apply immediately at work.

Better Institutional Results

The programme supports stronger planning, reporting, compliance, accountability and service delivery.

Sponsor-Friendly

This document is designed to help supervisors, HR units and sponsors approve delegate participation quickly.

Professional Recognition

Delegates receive training documentation and a certificate of completion after successful participation.

Our Training Centres & Delivery Options

Magna Skills offers flexible delivery through face-to-face training centres across Africa and beyond, plus Online / E-Learning for delegates who prefer remote participation.

Southern Africa

Practical training destinations with strong travel access and delegate support.

- Pretoria, South Africa
- Vic Falls, Zimbabwe
- Livingstone, Zambia

East Africa

Popular regional centres for government, NGO and donor-funded project teams.

- Kigali, Rwanda
- Kampala, Uganda
- Nairobi,
- Zanzibar, Tanzania

West Africa & Islands

Strategic locations for regional networking and executive capacity building.

- Accra, Ghana
- Port Louis, Mauritius

International Executive Venue

Premium destination training for senior teams and international delegates.

- Dubai, United Arab Emirates

Online / E-Learning

Attend from anywhere through live online, blended or self-paced learning options.

- Online, E-Learning
- Remote Teams
- Flexib

Organisation-Based Training

Magna Skills can also arrange dedicated in-house training for ministries, NGOs and companies.

- Onsite
- Custom Dates
- Group Training

Ready to Nominate Delegates?

Use the links below to register, review the live course page or contact Magna Skills for organisation-based training support.

Register / Apply Online | **View Full Course Page**

About Magna Skills

Magna Skills Development Institute provides practical capacity building programmes for government departments, NGOs, public institutions, donor-funded projects and private sector professionals across Africa. Our training approach combines expert facilitation, real workplace case studies, practical tools, post-training support and professional documentation that helps organisations strengthen staff performance and service delivery.

Government Training | NGO Capacity Building | Corporate Workshops | Online Learning | Face-to-Face Training | Certifica

Approval & Authorisation Form

This section may be completed by the organisation, department, HR office, finance office or sponsor approving delegate participation. It can be attached to an internal memo, procurement request or training approval submission.

Organisation / Department	
Delegate Name(s)	
Approved Course	Advanced Python Programming
Preferred Delivery Mode	☐ Online ☐ Face-to-Face ☐ Organisation-Based Training
Preferred Training Venue / Date	
Estimated Number of Delegates	
Budget / Vote Number	
Contact Person	
Email / Mobile	

Authorised Name _____ Signature / Stamp _____ Date _____