BLOCKCHAIN ARCHITECTURE
Training & Certification Guide

Arcitura® TRAINING — Blockchain

Arcitura® TRAINING — Blockchain Architecture

Arcitura® CERTIFIED — Blockchain Architect

itcc

PCC — PROFESSIONAL CERTIFICATION COALITION

Pearson | VUE

OnVUE

Acclaim

Credly by Pearson

Arcitura® DIGITAL

About the Next-Gen IT Academy

The Next-Gen IT Academy from Arcitura provides formal education and accreditation programs for contemporary technologies and fields of practice important and relevant to mainstream IT. This growing curriculum encompasses a set of individual tracks, each of which provides covers a distinct technology innovation and/or field of practice.

The Next-Gen IT Academy curriculum is comprised of 24 course modules and 8 certification tracks. For each topic area covered within the program, a set of 3 courses is developed, along with a single exam. Exams are available worldwide via Pearson VUE testing centers, as well as via Pearson VUE OnVue online proctoring and on-site delivery by Certified Trainers. Achieving a passing grade on a required exam achieves a certification for which a digital accreditation certificate is automatically issued by Arcitura and a digital certification badge is issued by Acclaim/Credly. Note that the completion of select Next-Gen IT courses and certifications are also applicable to some Digital Transformation accreditation requirements.

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HOW TO TAKE THIS COURSE

ARCITURA ELEARNING OPTIONS

To give you the most flexibility to achieve your learning goals and accommodate your preferences, this course is made available via two Arcitura eLearning solutions: An interactive environment with graded exercises and a graded self-test, as well as a study kit account that supports online/offline access and custom annotations.

To learn more, visit: www.arcitura.com/elearning

To enroll, visit: digital.arcitura.com/courses

ONSITE WORKSHOPS

Private onsite workshops can be delivered by Certified Trainers from Arcitura and authorized training partners for both small and large groups. Each workshop participant can receive access to the full Arcitura Digital eLearning course materials. Each workshop agenda, format and schedule can be tailored to client requirements.

To learn more, visit: www.arcitura.com/workshops

VIRTUAL WORKSHOPS

Private virtual workshops can be delivered by Certified Trainers for small and large groups, as well as individual participants. Workshop participants receive access to the course materials via the Arcitura Digital eLearning platform. Virtual workshop agendas can be tailored with greater flexibility to accommodate more distributed and fragmented training schedules.

To learn more, visit: www.arcitura.com/workshops
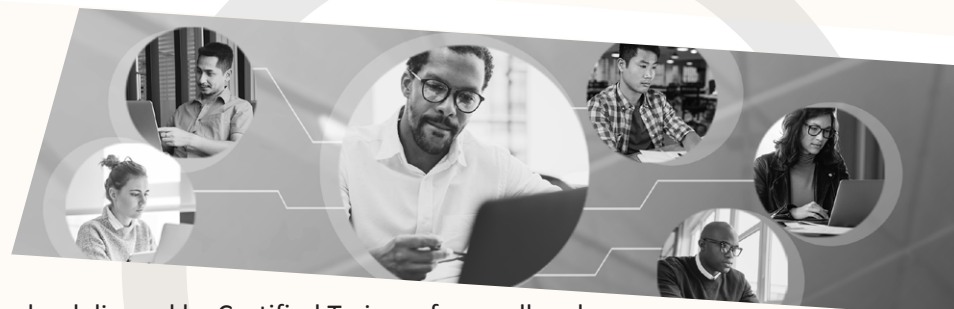
Several additional learning and exam preparation products and services are available, including coaching, exam prep kits and digital downloads. See the Training and Exam Preparation Resources page for details.

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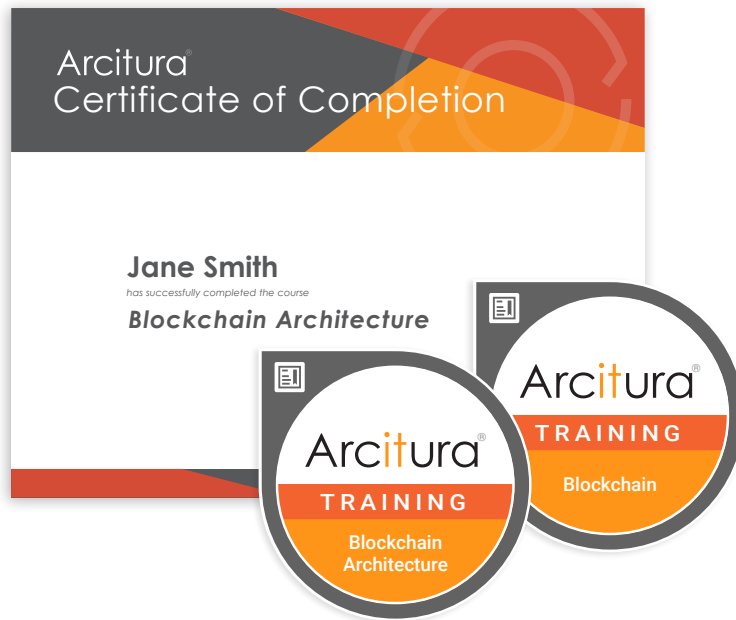
HOW TO GET STARTED

Welcome to the Blockchain Architecture course! This course is comprised of a set of modules. Each module has a set of lessons and is further supplemented with exercises to help reinforce your understanding of key topics. Upon completing the course, you can optionally proceed to prepare yourself for the certification exam (as explained on the *How to get Certified* page).

Additional resources are available to assist you with completing this course, including downloadable digital course files, printed course materials, coaching hours and instructor-led training services (as explained on the *Training and Exam Preparation Resources* page.)

Arcitura CERTIFIED

Blockchain Architect

A Certified Blockchain Architect understands the concepts, models and technology architecture behind Blockchain solutions for both public and private use, including the utilization of immutable data storage and consensus processing.

Module 01

Module 02

Module 03

CERTIFICATION EXAM

Arcitura
Certified Blockchain Architect

Arcitura
Certified Blockchain Architect

Jane Smith

has successfully completed the requirements
to be recognized as a certified Blockchain Architect.

HONORS

Arcitura CERTIFIED
Blockchain Architect

www.arcitura.com

Arcitura CERTIFIED

Blockchain
Architect

HOW TO GET CERTIFIED

You can become a Certified Blockchain Architect! This course can prepare you for the official Blockchain Architect Certification exam, which can be taken worldwide at Pearson VUE testing centers, via Pearson VUE online proctoring and/or Arcitura direct proctoring.

Upon attaining a passing grade on the certification exam (and fulfilling any other prerequisite exam requirements) you will achieve the Blockchain Architect Certification, after which you will automatically receive an official digital Accreditation Certificate and a digital Certification Badge from Acclaim/Credly with an account that supports the online verification of your certification status. Digital accreditation certificates and badges are free of charge.

Additional resources are available to assist you with preparing for the certification exam, including practice exam questions, downloadable digital course files, printed course materials, coaching hours and instructor-led training services (as explained on the *Training and Exam Preparation Resources* page.)

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The Blockchain Architecture course develops skills in Blockchain functions, architectural models, technology and security.
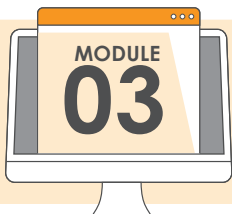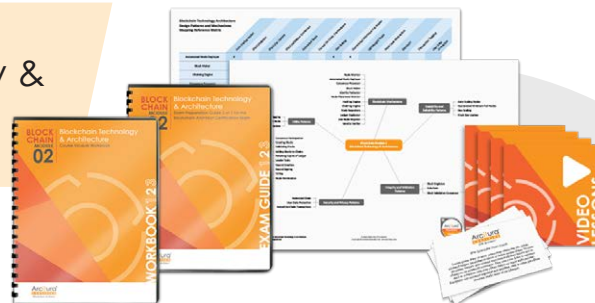
COURSE MODULE OUTLINES

The Blockchain Architecture course is comprised of the following course modules. Outlines for these course modules are provided on the subsequent pages.
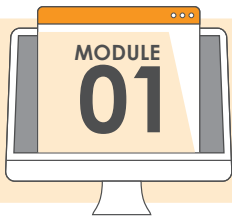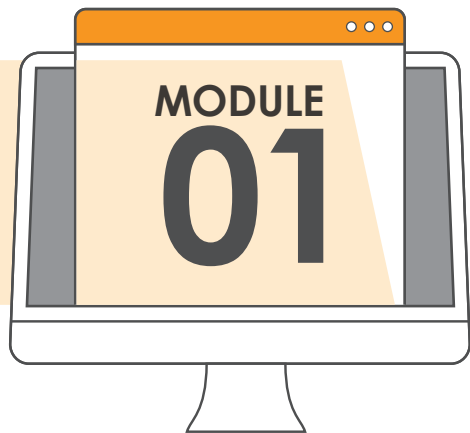
MODULE 01 — Fundamental Blockchain
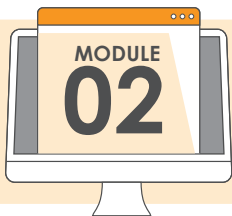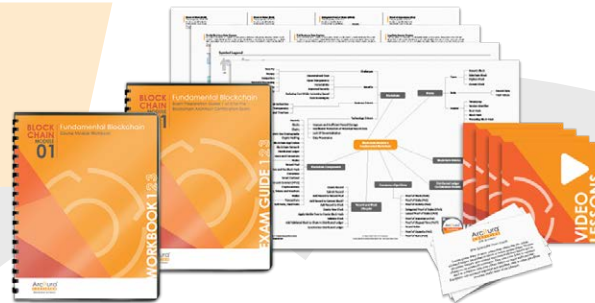
MODULE 02 — Blockchain Technology & Architecture

MODULE 03 — Blockchain Technology & Architecture Lab

Fundamental Blockchain

MODULE 01

This course module provides a clear, end-to-end understanding of how blockchain works. It breaks down blockchain technology and architecture in easy-to-understand concepts, terms and building blocks. Industry drivers and impacts of blockchain are explained, followed by plain English descriptions of each primary part of a blockchain system and step-by-step descriptions of how these parts work together.

The following primary topics are covered:

- Benefits and Challenges of Blockchain
- Blockchain Business Drivers and Technology Drivers
- Understanding Blockchain's Decentralized Model
- Blockchain Value Propositions
- How Blockchain Can be Used for Different Industries
- Blockchain Applications, Networks and the Distributed Ledger
- How the Distributed Ledger Can Relate to Relational Database
- Fundamental Components of a Blockchain Architecture
- Transactions, Records and Pools
- Blocks, Chains and Block Headers
- Blockchain Users, Full Nodes and Partial Nodes
- Step-by-Step Understanding of the Record and Block Lifecycle
- Step-by-Step Understanding of How the Merkle Tree Works
- Step-by-Step Understanding of How Consensus Works
- Consensus Algorithms (PoW, PoS, PoA, DPoS, LPoS, PoI, PoET, PoC, PoB, Round Robin)
- Public vs. Private / Permissionless vs. Permissioned Blockchains
- Coins, Tokens, Smart Contracts
- Basics of Crypto Hashing and Cryptography
- On-Chain, Off-Chain and Cross-Chain Activity
- Understanding Soft Forks and Hard Forks
- Common Blockchain Metrics

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Blockchain Technology & Architecture
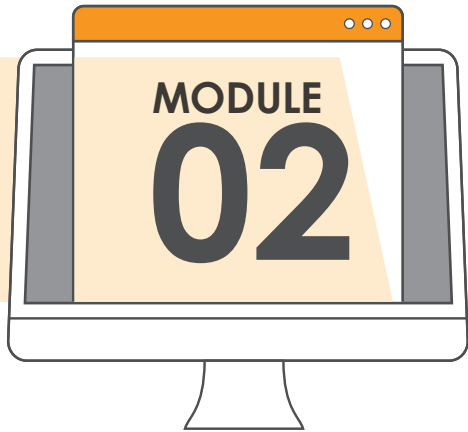
MODULE 02

This course module delves into blockchain technology architecture and the inner workings of blockchains by exploring a series of key design patterns, techniques and related architectural models, along with common technology mechanisms used to customize and optimize blockchain application designs in support of fulfilling business requirements.

The following primary topics are covered:

- Common Blockchain Technology Mechanisms and Artifacts
- Node Monitor, Automated Node Deployer, Node Placement Monitor
- Consensus Processor, Block Maker, Identity Federator
- Hashing Engine, Chaining Engine, Identity Verifier, Wallet
- Node Repository, Ledger Replicator, Live Node Migrator
- Integrity and Validation Blockchain Design Patterns
- Block Singleton, Sidechain, Block Validation Consensus
- Scalability and Reliability Blockchain Design Patterns
- Auto-Scaling Nodes, Guaranteed Minimum Full Nodes
- Geo Scaling, Block Size Update
- Security and Privacy Blockchain Design Patterns
- Forced On-Chain Transactions, Federated Chain
- User Data Protection
- Utility Blockchain Design Patterns
- Transaction Record Tagging
- Lightweight Node, Node Task Abstraction

Blockchain Technology & Architecture Lab

MODULE

03

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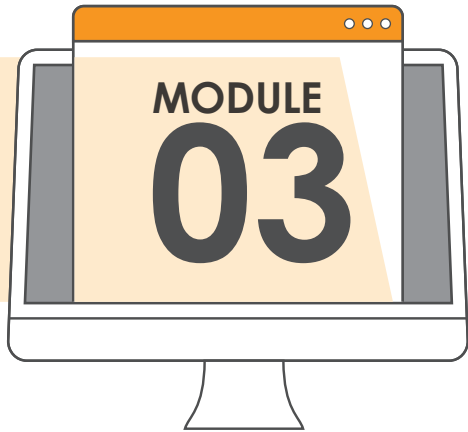
This course module presents participants with a series of exercises and problems that are designed to test their ability to apply their knowledge of topics covered in previous modules. Completing this lab will help highlight areas that require further attention and will further prove hands-on proficiency in blockchain technologies, mechanisms and security controls as they are applied and combined to solve real-world problems.

The following exercises are provided:

- Reading Exercise 3.1: AGT Research & Development Project Mini Case Study Background
- Lab Exercise 3.2: Permissioned Multi-Organization Blockchain Architecture
- Lab Exercise 3.3: Geographically Distributed Consensus Processing Architecture
- Lab Exercise 3.4: Mapping Business Goals to Blockchain Benefits
- Reading Exercise 3.5: REAN Association Mini Case Study Background
- Lab Exercise 3.6: Property Sale and Transfer Transaction Processing
- Lab Exercise 3.7: Mobile Device Support
- Lab Exercise 3.8: Consensus Processing Architecture
- Lab Exercise 3.9: Immutable Property Title Registry Log
- Lab Exercise 3.10: Blockchain-Enabled Real Estate Community Environment
- Lab Exercise 3.11: Business Goals to Blockchain Benefits Mapping
- Reading Exercise 3.12: Val2U Financial Mini Case Study Background
- Lab Exercise 3.13: Reliable Consensus Processing Architecture
- Lab Exercise 3.14: Off-Chain Funds Transfers
- Lab Exercise 3.15: Malicious User Countermeasures
- Lab Exercise 3.16: Business Goals to Blockchain Benefits Mapping
- Reading Exercise 3.17: MLHT-Tech Mini Case Study Background
- Lab Exercise 3.18: Decentralized Data Sharing
- Lab Exercise 3.19: Medical Center Business Data Filtering
- Lab Exercise 3.20: Patient Visit Record Codes
- Lab Exercise 3.21: Business Goals to Blockchain Benefits Mapping

TRAINING AND EXAM PREPARATION RESOURCES

You can supplement this course with a number of available resources to assist with both learning and exam preparation. Contact info@arcitura.com with any questions.

Certification Exam Prep Kit

A set of additional practice questions is available to support exam preparation.
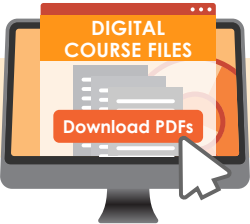
Digital Course Files

For each course you can order a set of downloadable digital course materials comprised of printable, watermarked workbook and poster PDF files.

Printed Course Materials

The printed workbooks and posters for each course can be ordered in B&W and full-color, and can be shipped worldwide.

One-on-One Coaching

Certified Trainers are available to provide online coaching on an hourly basis and in all time zones.

Instructor-Led Training

Certified Trainers are available to provide virtual and onsite training workshops for this and other Arcitura courses.

	COURSES → CERTIFICATIONS	Digital Transformation / Digital Transformation Specialist	Digital Transformation: Fundamental Technology / Digital Transformation Technology Professional	Digital Transformation: Advanced Technology & Architecture / Digital Transformation Technology Architect	Digital Transformation: Fundamental Data Science / Digital Transformation Data Science Professional	Digital Transformation: Advanced Data Science / Digital Transformation Data Scientist	Digital Transformation: Fundamental Security / Digital Transformation Security Professional	Digital Transformation: Advanced Security / Digital Transformation Security Specialist	Digital Transformation: Fundamental Intelligent Automation / Digital Transformation Intelligent Automation Professional	Digital Transformation: Advanced Intelligent Automation / Digital Transformation Intelligent Automation Specialist
MODULE 01	Fundamental Digital Transformation	●	○	○	○	○	○	○	○	○
MODULE 02	Digital Transformation in Practice	●	○	○	○	○	○	○	○	○
MODULE 03	Fundamental Cloud Computing		●	○						
MODULE 04	Fundamental Blockchain		●	○			●	○		
MODULE 05	Fundamental IoT		●	○						
MODULE 06	Cloud Architecture			●						
MODULE 07	Blockchain Architecture			●				●		
MODULE 08	IoT Architecture			●						
MODULE 09	Fundamental Big Data Analysis & Analytics				●	○				
MODULE 10	Fundamental Machine Learning				●	○				
MODULE 11	Fundamental AI				●	○				
MODULE 12	Advanced Big Data Analysis & Analytics					●				
MODULE 13	Advanced Machine Learning					●				
MODULE 14	Advanced AI					●				
MODULE 15	Fundamental Cybersecurity						●	○		
MODULE 16	Advanced Cybersecurity							●		
MODULE 17	Fundamental RPA								●	○
MODULE 18	Advanced RPA & Intelligent Automation									●
MODULE 19	Fundamental AI Decisioning								●	○
MODULE 20	Advanced AI Decisioning									●

Gray circles indicate prerequisite modules.

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COURSES	DevOps	Blockchain Architecture	IoT Architecture	Cybersecurity	Robotic Process Automation	Digital Business Technology	Containerization Architecture	Quantum Computing
CERTIFICATIONS	DevOps Specialist	Blockchain Architect	IoT Architect	Cybersecurity Specialist	RPA Specialist	Digital Business Technology Professional	Containerization Architect	Quantum Computing Specialist
DevOps — MODULE 01 Fundamental DevOps	●							
MODULE 02 DevOps in Practice	●							
MODULE 03 DevOps Lab	●							
Blockchain — MODULE 01 Fundamental Blockchain		●						
MODULE 02 Blockchain Technology & Architecture		●						
MODULE 03 Blockchain Technology & Architecture Lab		●						
Internet of Things — MODULE 01 Fundamental IoT			●					
MODULE 02 IoT Technology & Architecture			●					
MODULE 03 IoT Technology & Architecture Lab			●					
Cybersecurity — MODULE 01 Fundamental Cybersecurity				●				
MODULE 02 Advanced Cybersecurity				●				
MODULE 03 Cybersecurity Lab				●				
Robotic Process Automation — MODULE 01 Fundamental RPA					●			
MODULE 02 Advanced RPA & Intelligent Automation					●			
MODULE 03 RPA Lab					●			
Digital Business Technology — MODULE 01 Business Automation Technology Overview						●		
MODULE 02 Data Science Technology Overview						●		
MODULE 03 Digital & Security Technology Overview						●		
Containerization — MODULE 01 Fundamental Containerization							●	
MODULE 02 Containerization Technology & Architecture							●	
MODULE 03 Containerization Technology & Architecture Lab							●	
Quantum Computing — MODULE 01 Fundamental Quantum Computing								●
MODULE 02 Advanced Quantum Computing								●
MODULE 03 Quantum Computing Lab								●

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NEXT-GEN DATA SCIENCE ACADEMY

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COURSES / CERTIFICATIONS	Big Data Analytics & Fundamental Data Science / Big Data Science Professional	Big Data Analysis & Advanced Data Science / Big Data Scientist	Data Science Professional Consulting / Data Science Consultant	Machine Learning / Machine Learning Specialist	Artificial Intelligence / Artificial Intelligence Specialist	Big Data Engineering / Big Data Engineer	Big Data Architecture / Big Data Architect	Data Science Governance / Data Science Governance Specialist	AI Decisioning / AI Decisioning Specialist
MODULE 01 Fundamental Big Data Science & Analytics	●	○	○			○	○	○	○
MODULE 02 Big Data Analysis & Technology Concepts	●	○	○			○	○	○	○
MODULE 03 Big Data Analysis & Technology Lab	●		○						
MODULE 04 Big Data Analysis & Science		●							
MODULE 05 Advanced Big Data Analysis & Science		●							
MODULE 06 Big Data Analysis & Science Lab		●							
MODULE 07 Fundamental Machine Learning			●	●					
MODULE 08 Advanced Machine Learning				●					
MODULE 09 Machine Learning Lab				●					
MODULE 10 Fundamental Artificial Intelligence			●		●				
MODULE 11 Advanced Artificial Intelligence					●				
MODULE 12 Artificial Intelligence Lab					●				
MODULE 13 Fundamental Big Data Engineering						●			
MODULE 14 Advanced Big Data Engineering						●			
MODULE 15 Big Data Engineering Lab						●			
MODULE 16 Fundamental Big Data Architecture							●		
MODULE 17 Advanced Big Data Architecture							●		
MODULE 18 Big Data Architecture Lab							●		
MODULE 19 Fundamental Data Science Governance for Big Data, Machine Learning & AI								●	
MODULE 20 Advanced Data Science Governance for Big Data, Machine Learning & AI								●	
MODULE 21 Data Science Governance Lab for Big Data, Machine Learning & AI								●	
MODULE 22 Fundamental AI Decisioning									●
MODULE 23 Advanced AI Decisioning									●
MODULE 24 AI Decisioning Lab									●

Gray circles indicate prerequisite modules.

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COURSES / CERTIFICATIONS	Cloud Computing (Cloud Technology Professional)	Cloud Computing Professional Consulting (Cloud Computing Consultant)	Cloud Architecture (Cloud Architect)	Cloud Security (Cloud Security Specialist)	Cloud Governance (Cloud Governance Specialist)	Cloud Storage (Cloud Storage Specialist)	Cloud Virtualization (Cloud Virtualization Specialist)
MODULE 01 Fundamental Cloud Computing	●	○	○	○	○	○	○
MODULE 02 Cloud Technology Concepts	●	○	○	○	○	○	○
MODULE 03 Cloud Technology Lab	●	○					
MODULE 04 Fundamental Cloud Architecture		●	●				
MODULE 05 Advanced Cloud Architecture			●				
MODULE 06 Cloud Architecture Lab			●				
MODULE 07 Fundamental Cloud Security		●		●			
MODULE 08 Advanced Cloud Security				●			
MODULE 09 Cloud Security Lab				●			
MODULE 10 Fundamental Cloud Governance					●		
MODULE 11 Advanced Cloud Governance					●		
MODULE 12 Cloud Governance Lab					●		
MODULE 13 Fundamental Cloud Storage						●	
MODULE 14 Advanced Cloud Storage						●	
MODULE 15 Cloud Storage Lab						●	
MODULE 16 Fundamental Cloud Virtualization							●
MODULE 17 Advanced Cloud Virtualization							●
MODULE 18 Cloud Virtualization Lab							●

Gray circles indicate prerequisite modules.

SERVICE TECHNOLOGY SCHOOL

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COURSES	Fundamental Microservices & Service Technology	Fundamental SOA Design with Services & Microservices	SOA Analysis & Modeling with Services & Microservices	SOA Design & Architecture with Services & Microservices	Microservice Design & Architecture	Microservice Professional Consulting	Service API Design & Management	Service Governance & Project Delivery	Security for Microservices & SOA
CERTIFICATIONS	Microservice Professional	SOA Professional	SOA Analyst	SOA Architect	Microservice Architect	Microservice Consultant	Service API Specialist	Service Governance Specialist	Service Security Specialist
MODULE 01 — Fundamental SOA, Services & Microservices	●	●	○	○	○	○	○	○	○
MODULE 02 — Microservice Technology Concepts	●			○	○	○	○		○
MODULE 03 — Design & Architecture with SOA, Services & Microservices		●	○	●				○	
MODULE 04 — Fundamental SOA Analysis & Modeling with Services & Microservices			●						
MODULE 05 — Advanced SOA Analysis & Modeling with Services & Microservices			●						
MODULE 06 — SOA Analysis & Modeling Lab with Services & Microservices			●						
MODULE 07 — Advanced SOA Design & Architecture with Services & Microservices				●					
MODULE 08 — SOA Design & Architecture Lab with Services & Microservices				●					
MODULE 09 — Fundamental Microservice Architecture & Containerization					●	●			
MODULE 10 — Advanced Microservice Architecture & Containerization					●				
MODULE 11 — Microservice Architecture & Containerization Lab					●				
MODULE 12 — Fundamental Service API Design & Management						●	●		
MODULE 13 — Advanced Service API Design & Management							●		
MODULE 14 — Service API Design & Management Lab							●		
MODULE 15 — Fundamental Service Governance & Project Delivery								●	
MODULE 16 — Advanced Service Governance & Project Delivery								●	
MODULE 17 — Service Governance & Project Delivery Lab								●	
MODULE 18 — Fundamental Security for Services, Microservices & SOA						●			●
MODULE 19 — Advanced Security for Services, Microservices & SOA									●
MODULE 20 — Security Lab for Services, Microservices & SOA									●

Gray circles indicate prerequisite modules.

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