DASA
DEVOPS AGILE SKILLS ASSOCIATION

DASA DEVOPS FUNDAMENTALS

Syllabus

Version 1.0.3

October 2018

DASA

DEVOPS AGILE
SKILLS ASSOCIATION

RELEASE	VERSION	DATE
Previous	1.0.2	April 2017
Current	1.0.3	October 2018
Next	**TBD**	**TBD**

SCOPE AND PURPOSE OF THIS DOCUMENT

The purpose of this document is to inform all parties interested in the DevOps Fundamentals course of the areas covered in the course.

THE DASA DEVOPS COMPETENCE MODEL

The DevOps Agile Skills Association (DASA) competence framework identifies 8 knowledge areas (depicted in red-colored text) and 4 skills (depicted in blue-colored text) that are relevant in DevOps, as shown in the following figure.
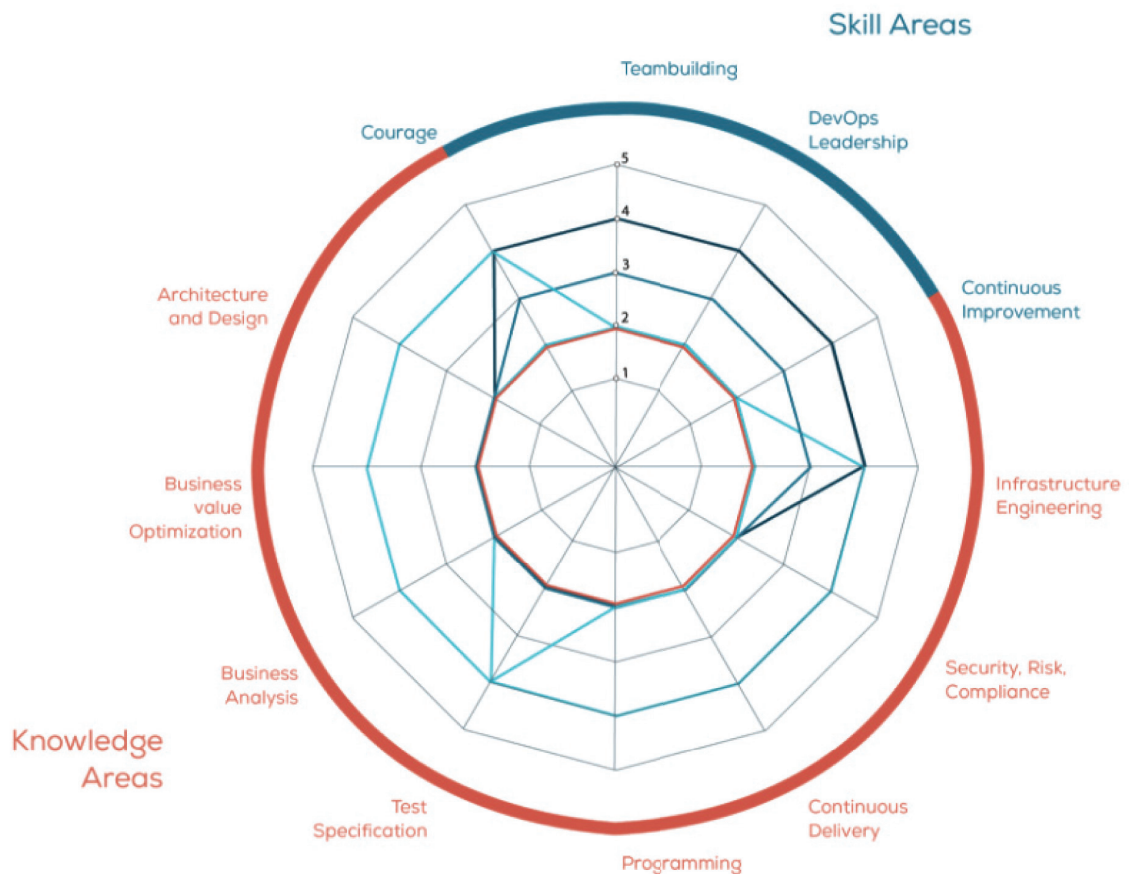
1- novice / 2- competent / 3- proficient / 4 - expert / 5 - master

Every individual operating in a DevOps team requires to be competent at all 8 knowledge areas and proficient at the 4 skill levels. In order for DevOps teams to be effective, they require all 12 areas to be at the Expert level. Individual team members can specialize in specific areas, in order for teams to achieve these capabilities.
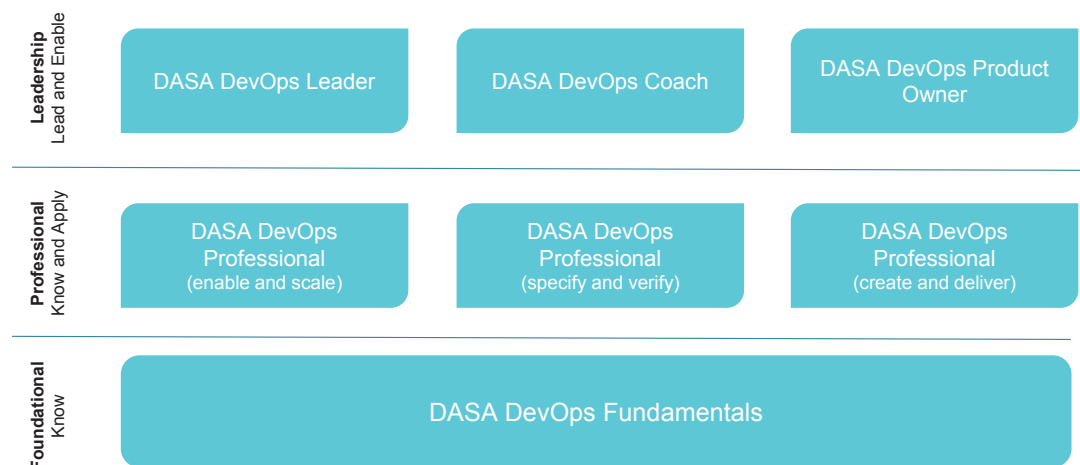
DASA DEVOPS FUNDAMENTALS

Up to 200 times faster software deployment, 30 times increased deployment frequency, and 60 times higher change success rates, organizations such as Netflix, Spotify, and Facebook are revolutionizing the IT game by successfully implementing DevOps principles. The data does not lie. You do not have to be a hot Web company or a monster enterprise to be a DevOps leader. Companies, large or small and young or old, have magnificently made the transition and have the proof of success in their pockets.

DevOps training is the starting point for an organization going on the DevOps journey. Improved workflows and faster deployment starts with a core understanding of DevOps fundamental concepts by anyone involved in an Agile and/or DevOps team.

DASA develops and evangelizes a vendor neutral DevOps qualification program for professionals, generates interest and awareness for the need for knowledge and skill development, promotes open source certification for DevOps knowledge and skills, and ensures quality of training for the market through a logical and threshold-driven qualification program.

Anyone can participate in defining role-based competences, learning paths, and qualification schemes. All existing learning content that maps against the DASA knowledge and skill areas has value. DASA will map content and demonstrate relevance and will maintain an open and logical operating model for training delivery, as shown in the following figure.

DASA DevOps Fundamentals provides an extensive introduction to the core Agile DevOps principles covering the essential knowledge and skill competences that have been defined by DASA.

Leadership Lead and Enable	DASA DevOps Leader	DASA DevOps Coach	DASA DevOps Product Owner
Professional Know and Apply	DASA DevOps Professional (enable and scale)	DASA DevOps Professional (specify and verify)	DASA DevOps Professional (create and deliver)
Foundational Know	DASA DevOps Fundamentals		

The DevOps Fundamentals qualification is designed to provide the core education necessary to build your DevOps vocabulary and to understand its principles and practices. With the help of key DevOps concepts and terminology, real-life case studies, examples and interactive group discussions and extensive exercises in each module you will acquire a fundamental understanding of DevOps.

QUALIFICATION OBJECTIVES

When you have acquired the required knowledge from this course, you will be able to:

- Explain the drivers responsible for the emergence of DevOps.

- Define and discuss the key concepts and principles of DevOps.

- List and explain the business benefits of DevOps and continuous delivery.

- Describe the Service Delivery process.

- Explain the concepts of test automation, infrastructure automation, and build and deployment automation.

- Describe how DevOps relates to Lean and Agile methodologies.

- Summarize case studies of IT organizations that are making the transformation to Adaptive IT and DevOps models.

- List the most common and popular DevOps tools.

- Discuss the critical success factors for DevOps implementation.

HOW DOES DEVOPS FUNDAMENTALS FIT INTO THE DASA COMPETENCE FRAMEWORK?

After completing this course, you will cover the area marked as DevOps Fundamentals in the following figure of the DASA qualification scheme. As a result, you will reach the "Competent" level of the scheme.

1 – novice / 2 – competent / 3 – proficient / 4 – expert / 5 – master

TARGET AUDIENCE

The DevOps Fundamentals qualification is primarily aimed at:

- Individuals involved in IT development, IT operations, or IT service management

- Individuals whose role are touched by DevOps and continuous delivery, such as the following IT roles:

    ◊ DevOps engineers

    ◊ Product owners

    ◊ Integration specialists

    ◊ Operations managers

    ◊ Incident and change managers

    ◊ System administrators

    ◊ Network administrators

    ◊ Business managers

    ◊ Automation architects

    ◊ Enterprise architects

COURSE REQUIREMENTS

Basic familiarity with Agile, Scrum, Lean, and ITSM principles is beneficial.

CERTIFICATION REQUIREMENTS

You will receive the required certification from DASA on successful completion of the DASA DevOps Fundamentals exam.

Exam Details

The characteristics of the DASA DevOps Fundamentals exam are:

Exam Format:

- Closed-book format
- Web-Based
- Participants may bring scratch paper

Questions:

- 40 multiple choice questions

Passing Score:

- 65%

Exam Duration:

- 60 minutes
- 15 minutes extra time for non-native English speakers.

LEARNING OUTCOMES

A classification widely used when designing assessments for certification and education is the Bloom's Taxonomy of Educational Objectives. This classifies learning objectives into six ascending learning levels, each defining a higher degree of competencies and skills. (Bloom et al, 1956, Taxonomy of Educational Objectives).

This structured approach helps to ensure:

- A clear delineation in learning level content between different qualification levels

- Learning outcomes are documented consistently across different areas of the guidance

- Exam questions and papers are consistent and are created to a similar level of difficulty.

The Fundamentals qualification examines learning outcomes at levels 1 (knowledge) and 2 (comprehension).

DASA DEVOPS PRODUCT OWNER LEARNING OUTCOMES				
	1. Knowledge	2. Comprehension	3. Application	4. Analysis
Generic Definition from Learning Outcomes	Know key facts, terms and concepts from the manual/ guidance	Understand key concepts from the manual/guidance	Be able to apply key concepts relating to the syllabus area for a given scenario	Be able analyze and distinguish between appropriate and inappropriate use of the method/ guidance for a given scenario situation
Qualification Learning Outcomes	Know facts, including terms, concepts, principles, tools and techniques from the DevOps Fundamentals curriculum	Understand the concepts, principles, and dimensions of DevOps and can explain how these are applied.		

SYLLABUS AREAS

The following syllabus areas are identified.

SYLLABUS AREA CODE	SYLLABUS AREA TITLE
IN	DevOps Introduction
CU	Culture
OR	Organization
PR	Processes
AU	Automation
MI	Measurement & Improvement

SYLLABUS

In the following tables, the key aspects of the DevOps Fundamentals Syllabus are described.

INTRODUCTION

Syllabus Area Code IN		Syllabus Area : Introduction (IN)	
Level	Topic		
Know the historical development of DevOps, the core concepts underlying DevOps and the DevOps Agile Skills Association **Specifically to recall:**			
01	01	• The relationship between the Digital Transformation and DevOps	
		• The high level description of DevOps	
		• The history and emergence of DevOps	
01	02	• The key elements of the Business Case for DevOps	
		• The principal benefits of DevOps	

01	03	• DevOps Definitions
		• The Culture of High Performance IT
		• The relationship between DevOps, Agile and Lean IT?
		• DevOps Principles and Aspects of IT
01	04	• The purpose of the DevOps Agile Skills Association (DASA):
		• DevOps Skills Areas, Knowledge Areas, and Competence Framework
		• DASA Qualification Scheme, Mission, and Vision

Understand the following aspects dealt with in the Introduction

Specifically to identify:

02	01	Possible problems that can arise due to the wall of confusion between Development and Operations
02	02	The core principles of DevOps
02	03	The 12 competence areas (4 Skill areas, 8 Knowledge areas) of the DASA Competence Framework
02	04	The 3 core profiles of the DASA Competence Framework

CULTURE

Syllabus Area Code		Syllabus Area :
CU		Culture (CU)
Level	Topic	
Know the key components of Culture		
Specifically to recall:		
01	01	• Build the DevOps Organization around teams • The Three Horizons Model for Innovation • Definition of a DevOps culture • Cultural Aspects of a DevOps Team • Two key elements of a DevOps Environment: Service Mindset and Quality at the Source
01	02	Key Skill Areas of the DevOps Agile Skills Association Competence Framework: • Team Building • Continuous Improvement • Courage • DevOps Leadership
01	03	Skill Area: Team Building • Definition of a team • Three key drivers of motivation: Autonomy, Mastery, Purpose (Pink) • Intrinsic motivation as a driver for working in teams • Collaboration as a Key Success Factor of a Team • Visual Management as a Key Tool of Teambuilding
01	04	Skill Area: Continuous Improvement • Importance of Quality at the Source • Cost of Accumulating Technical Debt • Role of Solving Problems in Continuous Improvement • Structured Problem-Solving • The Kaizen Mindset: Tackling the Root Cause of Problems

01	05	Skill Area: Courage
		• Courage to Act: A Key Behavior of a DevOps Team
		• Courage and Experimentation
		• Psychological Safety as a pre-condition for Courage
		• Relationship Between Experimentation and Complications
		• Experimentation Meetups: A Key Tool of Courage
01	06	Skill Area: DevOps Leadership
		• Leadership in a DevOps Environment
		• Mission Command philosophy as opposed to Central Command
		• Importance of Leadership to Overcome Five Barriers of Effective Collaboration
		• Role of Leaders in Stimulating the Use of Tools to Develop Effective Habits
		• Feedback: A Key Leadership Tool
01	07	Implementation of a DevOps Culture:
		• How to build a DevOps culture
		• Impact of Treating Change as a Program
		• Growing Culture: Experimenting, Measuring, and Probing
		• Importance of Tracking the Movement Towards a DevOps Culture
		• Cultural Change: A Collective Movement

Understand the following aspects related to Culture

Specifically to identify:

02	01	The key characteristics of a DevOps Culture
02	02	The way to build a DevOps culture
02	03	The challenges moving towards a DevOps Culture

ORGANIZATION

Syllabus Area Code OR		Syllabus Area : Organization (OR)
Level	Topic	
Know the key aspects of Organization **Specifically to recall:**		
01	01	Organizational Models: • Impact of DevOps on the Organization • Alignment of Organizational Model with IT Services • Traditional Structuring of Teams and Waste • Importance of DevOps Hybrid Versions • Activity-Focused Versus Product-Focused Approaches • DevOps Organogram
01	02	Autonomous Teams: • What is autonomy? • Autonomy of Teams • Criteria for Autonomous Teams • Decoupling Point: A Key Consideration for Autonomous Teams
01	03	Conway's Law and Organizations' Architecture
01	04	Solving the Autonomy Problems – A Real-life Example: The Spotify Model
01	05	Architecting for DevOps: • Aim of the IT Architecture • Focus on Building in Quality • Move towards smaller services in the IT architecture • Relation Between Complexity and Quality

01	06	• Micro Services Architecture (MSA) and its Characteristics
		• MSA Supports Faster, Cheaper, Better Software Development
		• Architecting for Systemic Resilience
		• Moving from Legacy to Smaller Services
01	07	Governance:
		• DevOps Governance
		• Governance Within Teams and Between Multiple Teams
		• Scrum of Scrums with Agile Teams to Coordinate and Collaborate

Understand the following aspects of Organization

Specifically to identify:

02	01	
02	02	

PROCESSES

Syllabus Area Code		Syllabus Area :
PR		**Processes (PR)**
Level	Topic	
Know the key aspects of Processes		
Specifically to recall:		
01	01	Definition of process and the key components of a process: goal, result, input, throughput, output, customer
01	02	DevOps in Relation to ITSM: • ITSM • DevOps and ITSM
01	03	Agile and Scrum: • Traditional Versus Agile • Role of Multidisciplinary Feature Teams • The Agile Manifesto • The Scrum Flow • Advantages of Working Agile
01	04	Optimizing Processes Using Lean: • What is Lean? • The Eight Types of Lean Wastes • Optimization of Processes Using Value Stream Mapping
01	05	Business Value Optimization and Business Analysis Using Story Mapping: • Role of Minimal Viable Product in an Agile Process • How Story Mapping works? • Role of Slices in Story Mapping
Understand the following aspects of Processes		
Specifically to identify:		
02	01	The advantages and disadvantages of developing software applications using the Waterfall approach
02	02	

AUTOMATION

Syllabus Area Code		Syllabus Area :
AU		Automation (AU)
Level	Topic	
Know the key aspects of Automation		
Specifically to recall:		
01	01	Automation for Delivery of Software: • Automation of Routine Jobs • Automation Changes the Focus Towards Engineering Tasks • DevOps Teams and Focus on the Delivery of Value • Everything as Code
01	02	Continuous Delivery Core Concepts: • What is continuous delivery? • Benefits of Automating Continuous Delivery • Cycle Time Reduction: Continuous Delivery Primary Goal • Primary Principles of Continuous Delivery • Continuous Delivery Versus Integration and Deployment • Continuous Delivery Focus Topics
01	03	Continuous Delivery Automation Concepts: • Software has to Flow • Impact of Continuous Delivery on a DevOps Team's Performance • Types of Feedback • Fail Fast: Immediate and Visible Failure! • DevOps Versus Continuous Delivery
01	04	Continuous Delivery Automation Focus Topics • Automation Build and Software Package Delivery Flow • Automated Test and Optimized Software Validation (Tests) • Automated Test: DevOps Merges Specification and Verification • Automated Deployment and its Benefits • Deployment Strategies • Automated Provisioning • Containerization (Microservices) • Continuous Delivery Backlog

01	05	Emergence of Cloud Technology and Principles: • Emergence of Cloud Computing • Cloud Services, Self Service Infrastructure, Platform, and Software • National Institute of Standardization (NIST) Cloud Principles
01	06	Cloud Service Concepts in a DevOps Organization: • Cloud Principles in DevOps Organizations • Different Conversations Between Development and Operations in a Traditional Organization • Different Interaction Styles Between Development and Operations in a DevOps Organization • DevOps Platform Teams as a "Cloud Service Provider" • DevOps Business System Product and Platform Product Teams • Different Types of Clouds to Operate
01	07	Automated Provisioning Concepts: • Pets Versus Cattle • Desired State Configuration to Automate Environments • Automated Provisioning with Mutable Infrastructure and Immutable Infrastructure • Continuous Delivery for Platform Products • Automated Provisioning and Engineering Mindset
01	08	Platform Product Characteristics and Application Maturity: • Services Required by DevOps Business System Teams • Product Teams, Cloud Services, and Freedom • Use of Platform Services and Maturity of Applications • How to apply Cloud concepts to an organization?

Understand the following aspects of Automation

Specifically to identify:

02	01	
02	02	

MEASURE AND IMPROVEMENT

Syllabus Area Code		Syllabus Area :
MI		**Measurement and Improvement (MI)**
Level	Topic	
Know the key aspects of Measurement and Improvement		
Specifically to recall:		
01	01	Importance of Measurement: • Need of Measurement and Feedback • Importance of Feedback: Three Ways Model • Measurements and CALMS • Relation Between Measurement and Responsibility
01	02	Choosing the Right Metrics • Survivorship Bias • Actions Based on Measurements • Performance Metrics Versus Performance Predictors (Leading and Lagging indicators) • Measuring Leading Indicators for Culture, Organizations, Process Efficiency, Software Development Automation, Data Center Automation, and Measurements • Top Practices Correlated with Deployment Frequency, Lead Time for Changes, and Mean Time to Recover (MTTR) • Top Five Predictors of IT Performance • IT Performance: Throughput Versus Stability

01	03	Monitoring and Logging:
		• Continuous Monitoring and its Scope
		• Optimized Monitoring for DevOps
		• Collecting Feedback from an Automated Software Delivery Pipeline
		• Dashboards to Build the Feedback Culture (Release Dashboard, Test and Quality Dashboard, Build Dashboard, Performance Dashboard, and Product Usage Dashboard)
		• Importance of Logging Stakeholders and Usage Examples

Understand the following aspects of Measurement and Improvement

Specifically to identify:

02	01	
02	02	