Carnegie Mellon University
School of Computer Science
Executive & Professional Education

Master DevOps with a 3X Advantage

Advanced Certificate Program in DevOps

Program Partner
NSE talent sprint

BATCH 2

4.5/5 PROGRAM RATING

cmu.talentsprint.com/devops

1. **Legendary Faculty**
   Pioneers in DevOps
2. **High Impact Format**
   Faculty Led Live Experiential Learning
3. **#1 CS School[1] Certificate**
   Carnegie Mellon University SCS

1 Legendary Faculty

Len Bass

DevOps, Software Architecture, User Interface Software, Security Architecture

Adjunct Faculty at CMU

- An Emeritus Professor, Software Engineer, and DevOps Researcher.
- Recognized for his contributions to software architecture.
- Led the User-Interface Software Group at Software Engineering Institute (SEI).
- Worked as a Senior Principal Researcher with NICTA (National ICT Australia).
- Author of best-selling DevOps and Software Architecture books.
- Member of advisory boards of top organizations like Microsoft and NASA.

Hasan Yasar

DevOps, Software Architecture, Cloud-based Application Development, and AI System Development

Technical Director of Continuous Deployment of Capability at Software Engineering Institute (SEI), CMU

- At SEI, Hasan leads a team that uses new-age technologies to build a Smart Software Platform.
- 25+ years of experience with expertise in software development and cyber security.
- Initially joined SEI and built solutions for government cyber security frameworks.
- Created a research agenda for the Cyber Security Solutions Directorate, directly supporting the US Dept. of Defense.
- Adjunct Faculty at CMU's Heinz College & Institute of Software Research.
- A noted speaker at global DevOps community summits.

Joseph Yankel

Automation, DevSecOps, Software Development

DevSecOps Innovations Leader at CMU - SEI

- Joined CMU as Senior Developer Team Lead for SEI's CERT Division.
- At CERT, he worked on DevSecOps, building, and testing distributed systems.
- Currently, leads the DevSecOps Initiative team at the SEI.
- Worked with many leading US companies like GE, Trustwave, and Smartronix.
- Helped the US Govt. to help mitigate vulnerabilities in the network architecture.
- Sergeant in the US Marine Corps between 1993 and 1997.

2 High Impact Format

Faculty Led Live Experiential Learning

Faculty-led

Live interactive classes by legendary faculty

Cohort-based

Effective learning with outstanding global peer group

Experiential

Mentor supported hands on practices and hackathons

Mentoring

Get mentored by industry experts and practitioners

3 #1 CS School[1] Certificate

Carnegie Mellon University

#1 World's CS School[1]

20 Nobel Laureates

13 Turing Awards

CMMI, developed at SEI, CMU.

CMMI: Capability Maturity Model Integration (CMMI) is a process level improvement training and appraisal program.

SEI: Software Engineering Institute

Carnegie Mellon University

A private, global research university, Carnegie Mellon University (CMU) is one of the world's most renowned educational institutions. With its cutting-edge education, a stellar alumni network of Nobel, Emmy, Tony, and Turing prize winners, innovative startups, and home to groundbreaking innovations, CMU has mastered creating a future as imagined.

School of Computer Science at CMU

The School of Computer Science (SCS) at CMU is widely recognized as one of the first and best computer science programs in the world. SCS is a home to researchers who have made developments in the fields of algorithms, computer networks, distributed systems, computational biology, robotics, language technologies, human–computer interaction and software engineering. To learn more, visit SCS website

Cutting-edge Curriculum

The state-of-the-art curriculum is delivered through LIVE interactive sessions with the world-renowned faculty.

Foundation

F1: Introduction to DevOps

- Introduction
  - Basics on SW Engineering Practices
- What is DevOps
  - Issues on typical SW delivery environment.
  - Errors on various stages
  - Common security problems
  - What is DevOps
  - Principles of DevOps
  - Culture/Communication
  - Team Structure"

Learning Objectives

- Learn principles of Devops
- Discover SW delivery environment
- Practice to eliminate deployment errors

F2: Networking and Cloud Fundamentals

- Networking
  - Network topology
  - IP address/protocols
  - DNS, DHCP, SCM
  - Ports
  - Firewall, IDSS, IPSS
- The Cloud
  - Cloud structure
  - Cloud deployment strategies
  - Scaling service capacity
  - Autoscaling
  - Distributed coordination
  - Cloud Security practices

Learning Objectives

- Practice networking fundamentals
- Learn cloud structure
- Able to setup virtual networking

F3: Virtual Machines, Containers and Container Management

- Virtual Machines
  - Hypervisor concept
  - Various VM (on-prem/cloud)
  - Secure configuration
- Containers
  - Container fundamentals
  - Orchestration
  - Container hardening
- Container Management
  - Container repositories
  - Clusters and orchestration
  - Serverless Architecture

Learning Objectives

- Practice to setup Virtualized platforms
- Ability to distinguish VM and Containers
- Use container management to deploy various container-based services.

F4: Scripting Languages

- bash Shell Scripting
  - Simple Bash Commands,
  - Return codes and exit status
  - Conditionals and case statements
  - Loops
  - Functions
  - Wildcards
  - Logging
  - Debugging

Learning Objectives

- Use shell/bash scripting to develop automation scripts
- Implement provisioning of virtualized platforms.
- Develop build and deployment scripts

F5: Information Security

- Infrastructure Security
  - Risk Management
  - Thread modeling
  - PKI/Certificates
  - Credential Management
  - Secure communication
  - Key management
  - Intrusion detection and prevention
  - Operational Security

Learning Objectives

- Learn Key Management
- Discover Credential management
- Discover Encryption techniques
- Discover PKI/Certificates

Core Modules

M1: Infrastructure as Code, Tools and Configuration Management

- Infrastructure as code
  - SW Environments
  - Environment Parity
  - Automation concepts
- Configuration Management
  - Environment Configuration
  - SW application/platform configuration
  - Compliance management

Learning Objectives

- Learn IaC principles and apply to main environment parity
- Understand and practice CM
- Maintain configuration parameters and apply to environment lifecycle practices.

M2: Deployment Pipeline

- Deployment Pipeline
  - SW deployment pipeline
  - Environment parity
  - Development Environment
  - Building Environment (Continuous Integration)
  - Staging Environment
  - Test harness
  - Test types
  - Continuous Delivery/Deployment
  - Deployment strategies
  - Data/App inconsistency
  - Secure deployment

Learning Objectives

- Development, integration, staging, and production environments
- Learn Continuous Integration (CI) practices
- Learn Continuous Deployment (CD) strategies
- Understand Testing for each environment

M3: Micro services Architecture & Service Mesh

- Microservices Architecture
  - Modular architecture
  - Microservices and DevSecOps
  - Service Quality attributes
  - Service Discovery

- Messaging concept
- Securing services
- Service dependencies

- Service mesh
  - Fundamentals.
  - Sidecar
  - Optimization of service communication

Learning Objectives

- Explore Modular architecture approach
- Adapt microservice architecture to support DevOps practices.
- Discover Messaging concept between microservices
- Learn to configure and deploy Service Mesh

M4: Postproduction, Measurement

- Telemetry
- Incident response
- SRE
- Production Engineering

Learning Objectives

- Develop common DevOps metrics
- Practice incident response for fielded systems
- Adopt continuous feedback practices across DevOps pipeline

M5: Secure Development

- Secure SW development practices
- Dynamic Thread modelling
- Mitigation strategies
- Common vulnerabilities (CVE, CWE)
- Security testing (Risk based, SAST, DAST)
- Vulnerability Discovery ad patching
- SW supply chain, SW assurance
- Blue/Read teaming

Learning Objectives

- Apply fundamental security principles to DevOps environment and applications to be developed and deployed
- Adapt DevOps practices into various domains like highly regulated environments
- Implement continuous deployment for AI systems

M6: Domain Specific DevOps

- DevSecOps in HRE(Highly regulated environment)
- MLOPs
- DataOps
- IoT System Development and Deployment
- Finance, healthcare,
- Safety critical systems

Learning Objectives

- Explore MLOps (Machine learning and operations) practices
- Discover Cyber Physical systems
- Discover Highly Regulated environments

Hands-on Practices Modules & Tools

Provisioning

Vagrant Terraform VM

Containerization

docker

SSH/Network Traffic

WIRESHARK

Secure Build practices

Jenkins sonarqube

Deployment Practices

Jenkins ANSIBLE Nexus

Container Management

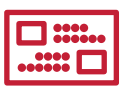
kubernetes

Secure Deployment

Jenkins kubernetes

Service Mesh

Istio Argo Rollouts

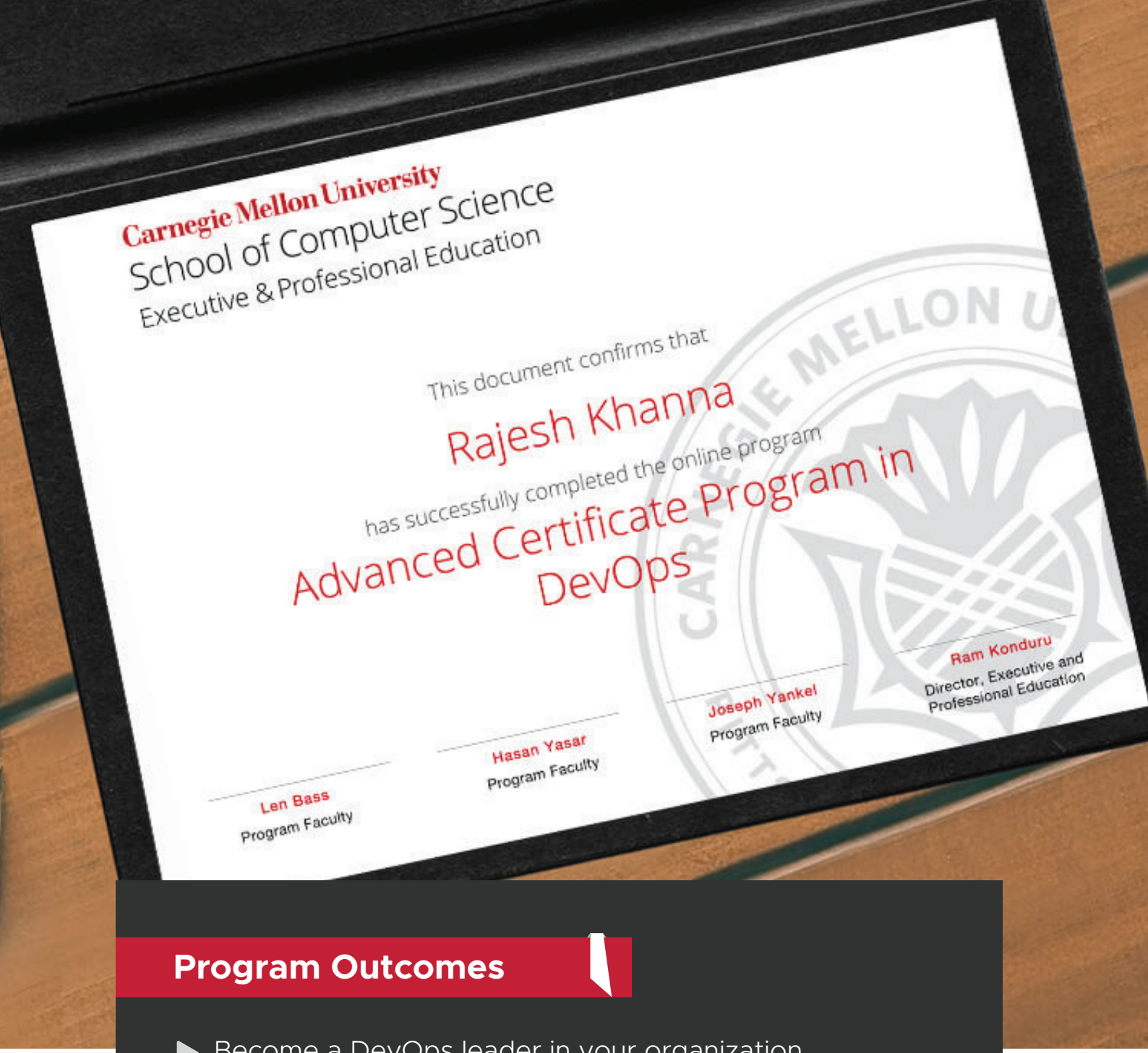


Monitoring

Nagios

Telemetry

Logstash Jenkins



Program Outcomes

- Become a DevOps leader in your organization
- Accelerate your career as a DevOps specialist
- Globally recognized certification

TalentSprint Career Accelerator Program

Supports certified learners looking for a new career

Professional Development

- Resume Building and LinkedIn Profile Makeover
- Interview Practice Sessions
- Dedicated Portfolio Page to showcase project and program accomplishments

Network with Peers and Alumni

- Knowledge exchange sessions with business/tech leaders
- Lifetime membership to TalentSprint Alumni Network
- Access to incubators for promising startup ideas

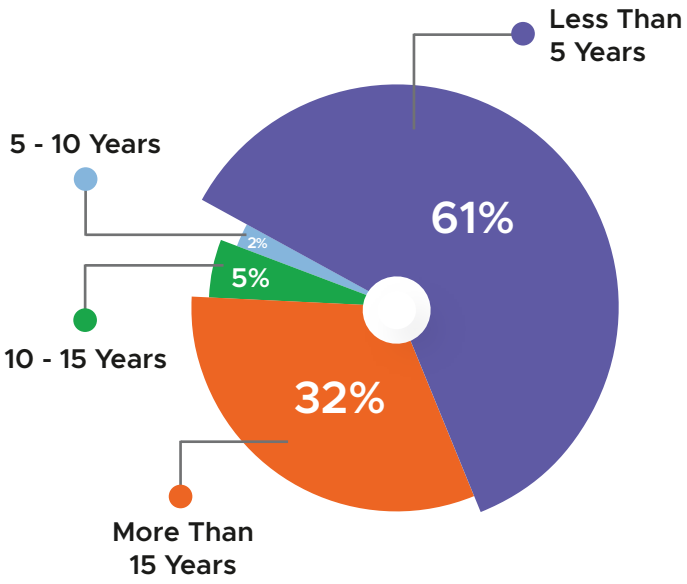
Access to Career Opportunities

- 6 months membership of IIMJobs Hirist
- Annual Career Fair and career opportunities from 500+ hiring partners
- Exclusive Job Alerts through TalentSprint Alumni Network

*Terms & Conditions apply

Participant Profile

Experience



Across India and Global Locations

Aurangabad
Bengaluru
Gurgaon
Hyderabad
Mumbai
New Delhi
Noida
Chester Springs
Frankfurt
Malvern
New York
Sidoarjo
Whitby

From Diverse Job Roles

Graduate Trainee
System engineer
Solution Architect
Senior Team Lead
Senior Software Engineer
Principle Architect
Principal Software Engineer
Principal Oracle Agile Engineer
Lead DevOps Engineer
Group Manager
Engineering Lead
Director Software Development
DevOps & Backend Lead
Dev Lead
Delivery Manager
Agile Engineer

From Top Organizations

NPCI
DLL Group
Xavient
Wipro
UniPin
Purolator
Tata consultancy services
Nagarro
KIND LLC
IBM
Concentrix
HCL Technologies
Diebold Nixdors
Cognizant
Microchip Technologies

Who is this program for?

- DevOps Engineers
- Cloud Computing professionals
- Software Developers
- Operation / Project / Product Managers
- Automation Engineers / QA / Testers

Fresh Graduates passionate about building a career in DevOps may be selected based on the decision of the selection panel.

Program Prerequisites

Participants must have some exposure to, or experience in the software development planning, delivery and deployment process.

Take the Next Step

If you are confident that the program is the right fit for you, apply now.

Fee*

Details	Indian Participants	International Participants
Application Fee	₹2,000	$25
Program Fee	₹2,40,000	$3,000

Flexible EMI Options available for participants from India

Nominate your employees to avail special benefits

Scholarship Available

*Fees paid are non-refundable and non-transferable.

About TalentSprint

12 Years of Excellence

350K Empowered Professionals

85 Net Promoter Score

95% Completion Rate

Established in 2010, TalentSprint is a part of NSE group and a global edtech company that brings transformational high-end and deep-tech learning programs to young and experienced professionals. The company's digital learning platform ipearl.ai offers a hybrid onsite/online experience to seekers of deep technology expertise. TalentSprint partners with top academic institutions and global corporations to create and deliver world class programs, certifications, and outcomes.Its programs have consistently seen a high engagement rate and customer delight. It is a leading Innovation Partner for the National Skill Development Corporation, an arm of the Ministry of Skill Development and Entrepreneurship, Government of India. A recipient of various prestigious accolades, TalentSprint was recently honored with the Indian Achievers Award 2022, for its excellence in building deeptech talent in India. For more information about TalentSprint, visit www.talentsprint.com

References : 1

Carnegie Mellon University

School of Computer Science

Executive & Professional Education

cmu.devops@talentsprint.com

Program Partner

NSE talent sprint

cmu.talentsprint.com/devops