Caltech | Center for Technology & Management Education

Post Graduate Program in DevOps

In Collaboration with

Silver Business Partner

IBM

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About the Program

Accelerate your career with this acclaimed Post Graduate Program in DevOps, in collaboration with Caltech CTME. This program features the perfect mix of theory, case studies, and extensive hands-on practice to prepare you for a fast-growing field that bridges the gap between software developers and operations. This Post Graduate Program, designed for graduates in any discipline and experienced professionals from programming and non-programming backgrounds, offers a blend of self-paced videos, live virtual classes, hands-on projects, and labs. Students also have access to mentorship sessions, providing a high-engagement learning experience and real world applications to help master essential DevOps skills. Students also will get hands-on experience in continuous deployment using current configuration management tools like Ansible and Terraform. At the end of this course, learners will be able to write and master front-end deployment and back-end codes and manage hosts for both monitoring and scaling. This program will enable students to demonstrate their knowledge of automating workflow and getting products to market more efficiently and effectively with tools such as Jenkins, Ansible and Terraform. Learners will also get practical experience with the development and operational activities of teams, continuous code releases, integration, and deployment processes.

Key Features of the Post Graduate Program in DevOps in collaboration with Caltech CTME

Caltech CTME Post Graduate Certificate

40+ In-demand skills & 15+ tools

Up to 25 CEUs from Caltech CTME upon course completion

8X higher live interaction with live online classes by industry experts

Masterclasses taught by Caltech CTME instructors

20+ Real-life projects on integrated labs

Caltech CTME circle membership

About the Post Graduate Program in DevOps in Collaboration with Caltech CTME

Founded in 1891, Caltech is a world-renowned science and engineering institute that marshals some of the world's brightest minds and most innovative tools to address fundamental scientific questions and pressing societal challenges. Caltech prizes excellence and ambition. The contributions of Caltech's faculty and alumni have earned national and international recognition, including 38 Nobel Prizes and nearly 60 National Medals of Science. The institute manages the Jet Propulsion Laboratory (JPL) for NASA.

CTME is embedded in Caltech's Division of Engineering and Applied Science. Caltech CTME has a unique role to play in applying the capabilities of scientists and engineers to the challenges of today's technology-driven businesses. This program applies executive education and professional development directly to real-world problems. Our experts teach the tools and perspectives that elevate careers and help companies achieve their goals.

Upon completing this program, you will receive:

- Caltech CTME Post Graduate Certificate
- Caltech CTME Bonafide Certificate
- Individual course completion certificate for all the courses in learning path from Simplilearn
- Program performance report for the entire learning path in the program
- Up to 25 CEUs from Caltech CTME
- Caltech CTME Circle membership

About Simplilearn

Simplilearn is the world's #1 online bootcamp provider that enables learners through rigorous and highly specialized training. We focus on emerging technologies and processes that are transforming the digital world, at a fraction of the cost and time as traditional approaches. Over two million professionals and 2000 corporate training organizations have harnessed our award-winning programs to achieve their career and business goals.

Program Eligibility Criteria and Application Process

Those wishing to enroll in the Post Graduate Program in DevOps in collaboration with Caltech CTME will be required to apply for admission.

Eligibility Criteria

For admission to this Post Graduate Program in DevOps, candidates:

- Prior work experience is not mandatory
- A bachelor's degree with an average of 50% or higher marks
- Can be from a programming or non-programming background

Application Process

The application process consists of three simple steps. An offer of admission will be made to the selected candidates and accepted by the candidates upon payment of the admission fee.

STEP 1

Submit an Application

Complete the application and include a brief statement of purpose to tell our admissions counselors why you're interested and qualified for this Post Graduate Program in DevOps.

STEP 2

Application Review

After you submit your application, a panel of admissions counselors will review your application and statement of purpose to determine your qualifications and interest in the program.

STEP 3

Admission

An offer of admission will be made to qualified candidates. You can accept this offer by paying the program fee.

Talk to an Admissions Counselor

We have a team of dedicated admissions counselors who are here to help guide you in the application process and related matters.

They are available to:

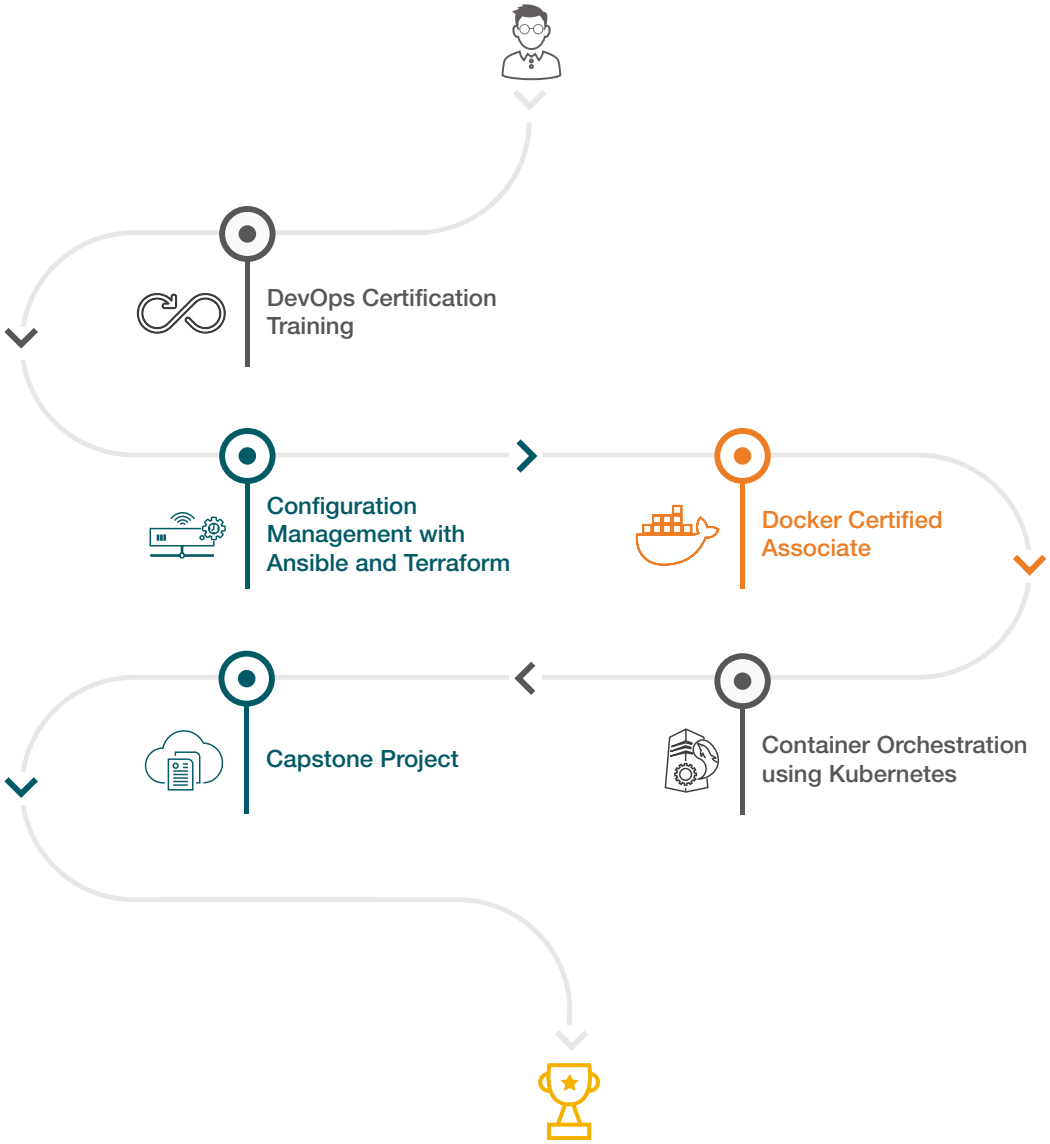
- Address questions related to the application
- Assist with financial aid (if required)
- Help you better understand the program and answer your questions

Who Should Enroll in this Program?

This program caters to those who are hoping to enter the world of DevOps or want to update their skills, as it is designed and structured to accommodate various professional backgrounds. Although there are no prerequisites for taking this training program, individuals in the following roles and disciplines are ideal for this course:

- Fresh graduates who intend to take the plunge into the DevOps job market
- Professionals with less than two years of experience who are working in either technical or non-technical job roles and wish to build successful careers in the DevOps world
- People working in the following roles will benefit the most from the Post Graduate Program in DevOps:
  - IT team leaders
  - Software developers
  - Systems administrators and IT managers
  - Cloud engineers
  - Developers
  - Engineers

Learning Path



Electives

- Caltech CTME DevOps Master Class
- Docker with IBM
- Kubernetes with IBM
- PG DO - CI/CD Pipeline with Jenkins
- PG DO - Git and GitHub Training
- DevOps on Cloud
- Industry Masterclass: DevOps

Program Outcomes

Understand the fundamentals of DevOps engineering and be fully proficient with DevOps terminologies, concepts, benefits, and deployment options to meet your business requirements

Deliver change requests from customers rapidly and effectively by adding new (and updating existing) features

Obtain complete knowledge of version control systems to effectively track changes made with Git and Github training

Develop a sound understanding of security and performance testing to safeguard releases from vulnerabilities

Gain a detailed overview of continuous integration and container ecosystems by learning tools such as Jenkins and Docker

DevOps Certification Training

STEP 1 2 3 4 5

Prerequisites

Fundamentals of Linux and Java

Module Overview:

Simplilearn's DevOps Practitioner course is designed to prepare you to succeed in forthcoming software development projects. This training has been designed to follow best practices for software development and to make the most efficient use of the latest software tools in the field. The course follows the entire software development lifecycle from requirements analysis through coding, production, and support.

Module Curriculum:

- Lesson 1. Introduction to DevOps
- Lesson 2. Version Control System
- Lesson 3. CI/CD Pipeline with Jenkins
- Lesson 4. Software and Automation Testing Frameworks
- Lesson 5. Configuration Management with Ansible
- Lesson 6. Containerization with Docker
- Lesson 7. Continuous Monitoring
- Lesson 8. Continuous Orchestration with Kubernetes

Module Outcome:

By the end of this course, learners will be able to:

- Work with DevOps Tools like, Github, Jenkins, Ansible, Terraform, Docker, Nagios, and Kubernetes
- Gain knowledge about DevOps equivalent to a DevOps engineer with two to three years of experience
- Integrate different technologies and frameworks
- Automate infrastructure provisioning

Projects:

- Lesson-end Project: Create a New Branch and Merge the Branch in Git
- Lesson-end Project: Building a Maven Project with Jenkins
- Lesson-end Project: Continuous Integration with Selenium in Jenkins
- Lesson-end Project: Provision EC2 using Terraform
- Lesson-end Project: Containerizing Legacy Docker Application
- Lesson-end Project: Deploy an App to the Kubernetes Cluster
- Course-End Project 1: Automating Infrastructure using Terraform
- Course-End Project 2: Deploy a WordPress Application to a Kubernetes Cluster

Demos:

- Assisted Practice: Execute Basic Linux Commands
- Assisted Practice: Create and Clone a GitHub Repository
- Assisted Practice: Create a Pull Request in Git
- Assisted Practice: Push File to GitHub Repository
- Assisted Practice: Create a Branch in Git
- Assisted Practice: Switching Branches in Git
- Assisted Practice: Merging Branches in Git
- Assisted Practice: Integrate Git with Jenkins
- Assisted Practice: Creating a Freestyle Build Job
- Assisted Practice: Integrate Maven with Jenkins
- Assisted Practice: Integrate Ant with Jenkins
- Assisted Practice: Remote Triggering of a Parameterized Build
- Assisted Practice: Selenium WebDriver Installation and Integration in Eclipse
- Assisted Practice: Running the first Selenium Test Case
- Assisted Practice: Setting up TestNG in Eclipse
- Assisted Practice: Testing the Automation Script

- Assisted Practice: Adding Selenium Plugin to Jenkins
- Assisted Practice: Demonstrate YAML Scripting
- Assisted Practice: Set Up Apache Server using Ansible
- Assisted Practice: Ansible Modules
- Assisted Practice: Creating and Working with Ansible Roles
- Assisted Practice: Set up Terraform
- Assisted Practice: Create an S3 Bucket Using Terraform
- Assisted Practice: Performing CRUD Operations on Containers
- Assisted Practice: Creating a Docker Image
- Assisted Practice: Docker Compose Setup
- Assisted Practice: Docker Registry
- Assisted Practice: Docker Networking with SSH
- Assisted Practice: How to Install Nagios Monitoring Tool
- Assisted Practice: Continuous Monitoring on Docker with ELK Stack
- Assisted Practice: Kubernetes Installation and Cluster Setup
- Assisted Practice: Pod Creation in Kubernetes
- Unassisted Practice: Install Git on Linux
- Unassisted Practice: Setting up Jenkins
- Unassisted Practice: Setting up Ansible
- Unassisted Practice: Docker Community Edition Installation

Configuration Management with Ansible and Terraform

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Configuration management is one of the most important stages in the DevOps pipeline. This course provides an in-depth understanding of the concepts of Ansible, and Terraform.The DevOps lifecycle is a collection of engineering practices providing a systematic way to manage all of the entities required for efficient deployment. These entities include the code, the infrastructure, and the people who take care of the infrastructure.

Key Learning Objectives

- Gain an in-depth understanding of the concept of configuration management
- Work on the tools: Ansible and Terraform
- Understand the benefits of configuration management and infrastructure as code
- Understand the automation skills to scale your infrastructure

Course curriculum

- Lesson 01: Course Introduction
- Lesson 02: Getting started with Configuration Management
- Lesson 03: Ansible Configuration
- Lesson 04: Ansible Ad-hoc Commands
- Lesson 05: YAML Basics
- Lesson 06: Writing Ansible Playbooks
- Lesson 07: Ansible Jinja2 Templates
- Lesson 08: Working with Ansible Roles
- Lesson 09: Advanced Ansible
- Lesson 10: Terraform
- Lesson 11: Terraform Loops, Built-in Functions,Provisioners

Docker Certified Associate

STEP 1 2 3 4 5

This training course is aligned with the Docker Certified Associate (DCA) Certification body and covers the concepts of Docker at a deep level. You will be able to comprehend Docker and its role in the DevOps lifecycle; create images, containers, swarms, volumes, and networks; define Docker security client bundles and client-server authentication; and more.

Key Learning Objectives

- Understand the basics and features of Docker
- Run a Docker container and image creation management
- Understand tools that support Docker to ease application deployment, continuous integration, service discovery, and orchestration
- Understand Docker networking models and use cases
- Install and uninstall Docker Enterprise
- Discuss Docker security in detail using Demons

Course curriculum

- Lesson 1 - Course Introduction
- Lesson 2 - Introduction to Docker
- Lesson 3 - Image Creation, Management, and Registry
- Lesson 4 - Orchestration
- Lesson 5 - Networking
- Lesson 6 - Installation and Configuration of Docker Enterprise
- Lesson 7 - Security

Container Orchestration using Kubernetes

STEP

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Kubernetes is one of the most popular container orchestration tools available. The Container Orchestration with Kubernetes Certification course will help you grasp the key skills, technology, and concepts that a Kubernetes administrator needs to know.

Key Learning Objectives

- Understand Kubernetes core concepts and terminologies
- Install and deploy Kubernetes cluster
- Understand pods and scheduling techniques
- Perform logging, monitoring, services, and volumes in Kubernetes
- Troubleshoot application and network failures
- Perform auditing and logging the cluster events

Course curriculum

- Lesson 01 - Course Introduction
- Lesson 02 - Core Concepts
- Lesson 03 - Kubernetes Cluster
- Lesson 04 - Workloads
- Lesson 05 - Scheduling
- Lesson 06 - Services, Load Balancing, and Networking
- Lesson 07 - Storage
- Lesson 08 - Azure Kubernetes Service
- Lesson 09 - Troubleshooting and Kubernetes Case Studies

Capstone Project

STEP

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This DevOps capstone project will give you an opportunity to implement the skills you learned throughout this program. Through dedicated mentoring sessions, you'll learn how to solve a real-world, industry-aligned problem. This project is the final step in the learning path and will enable you to showcase your expertise in DevOps to future employers.

Electives

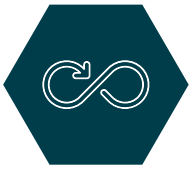
Caltech CTME DevOps Master Class

PG DO - Git and GitHub Training

Docker with IBM

DevOps on Cloud

Kubernetes with IBM



Industry Masterclass: DevOps

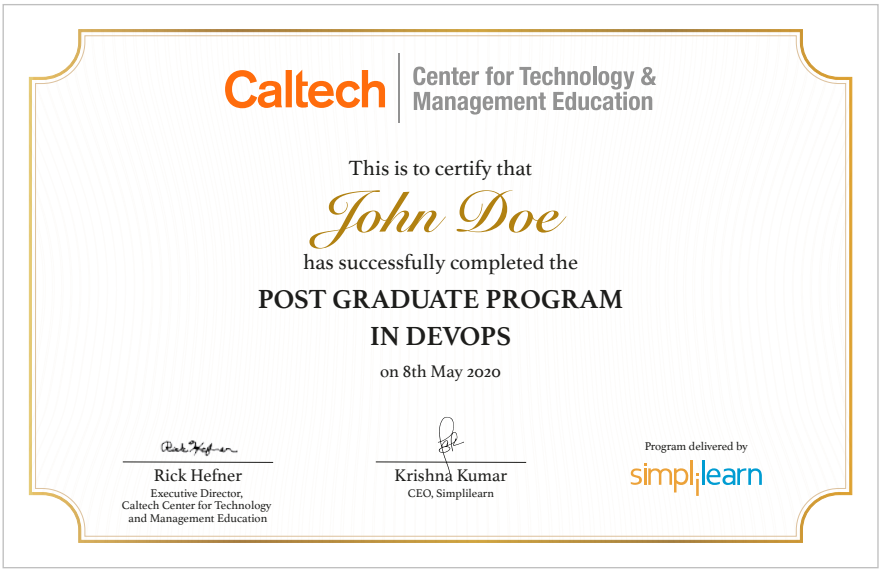
PG DO - CI/CD Pipeline with Jenkins

Academic Master Classes

– Caltech CTME

Attend an online interactive masterclass conducted by the instructor from the Caltech CTME and get insights about advancements in the DevOps domain and understand why it has become important for any organization to understand and implement DevOps to scale up.

Certificate



Upon completion of this Post Graduate Program in DevOps you will receive the Caltech CTME Post Graduate Certificate. You will also receive certificates from Simplilearn for the courses in the learning path. These certificates will testify to your skills as an expert in DevOps.

Advisory Board Members

Rick Hefner, Ph.D.

Program Director, Caltech Center for Technology & Management Education

rhefner@caltech.edu

Rick Hefner, PhD, specializes in systems development and maintenance; project management; Lean Six Sigma; process improvement, technology transfer; and risk management. His experience spans over 35 years. Dr. Hefner recently served as Director of Process Management at Northrop Grumman Corporation, where he managed corporate process initiatives related to Lean Six Sigma and program management.

Previous positions at Northrop Grumman (formerly TRW) included managing technology process initiatives and helping to establish the corporate engineering and program management processes. Previously, at Aerospace Corporation, Dr. Hefner was the Director of their Software Development department. He served as an engineer, technical specialist, project manager, and section manager.

Dr. Hefner has also worked with companies in the communications, electronics, and health sciences industries, including Applied Physics Laboratory, Ares Management, Boeing, DRS Technologies, Herbalife, Honeywell, Jet Propulsion Laboratory, John Deere, L-3 WESCAM, Maytag, Motorola, Pacific Bell, Raytheon, Schlumberger, Southern California Edison, St. Jude Medical, Toshiba, U.S. Navy, and Xerox. Dr. Hefner is credited with over 200 publications and presentations. He earned his PhD from the University of California, Los Angeles, in applied dynamic systems control. He received his MS and BS from Purdue University in interdisciplinary engineering.

simplilearn

USA

Simplilearn Americas, Inc.
201 Spear Street, Suite 1100, San Francisco, CA 94105
United States
Phone No: +1-844-532-7688

INDIA

Simplilearn Solutions Pvt Ltd.
53/1 C, Manoj Arcade, 24th Main, Harlkunte
2nd Sector, HSR Layout
Bangalore - 560102
Call us at: 1800-212-7688

www.simplilearn.com

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