

**Caltech**

Center for Technology &  
Management Education

# Post Graduate Program in Full Stack Web Development



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# About the Program

This Post Graduate Program, designed in collaboration with the Caltech CTME, will prepare you for a high-growth career path in software development. You will be taken on a journey of end-to-end software development through a mix of theory, case studies, and extensive hands-on practice through labs. Students also have access to mentorship sessions, providing a high-engagement learning experience; and real-world applications to help you master essential full stack web development skills.

The course curriculum is designed with a special emphasis on a practical learning experience. You will hone your programming continuously through regular practice in high-quality virtual labs. The course includes a Capstone project where learners can choose from four different fields and build high quality applications using the latest technologies—which will become a part of their portfolios.

At the end of this course, learners will be able to work on both front-end and back-end Java technologies. In addition, relevant concepts from DevOps and testing are covered. The course begins with the basic concepts and progressively takes you to advanced aspects of web development. Gaining expertise in technologies such as Angular, Spring Boot, Hibernate, Servlets, JSPs, MVC, and web services will open multiple career avenues for you.



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# Key Features of the Post Graduate Program in Full Stack Web Development in Collaboration with Caltech CTME

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Caltech CTME Post Graduate Certificate



Simplilearn Job Assistance with IIMJobs (India Only)



Receive upto 25 CEUs from Caltech CTME upon course completion



Simplilearn Career Service from Talent Inc. (U.S only)



Master Classes taught by Caltech CTME instructor



250+ hours of Applied Learning



Online Convocation by Caltech CTME Program Director



Capstone Project in 4 domains



Physical certificate from Caltech CTME (on request)



20 lesson-end and 5 phase-end projects



Caltech CTME Circle Membership



Build your own portfolio on GitHub

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## About Caltech CTME

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Founded in 1891, Caltech is a world-renowned science and engineering research and education institution. Caltech's scientific, engineering, and technological contributions have earned national and international recognition, including the 32 Nobel Prizes awarded to its faculty and alumni.

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 directly applies executive education and professional development 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
- ✓ Individual course completion certificates for all courses in the learning path
- ✓ Individual course completion certificate for all the courses in learning path from Simplilearn
- ✓ Program performance report for the entire learning path in the program
- ✓ Receive upto 25 CEUs from Caltech CTME upon course completion
- ✓ Access to Caltech Circle Membership
- ✓ Physical certificate with Caltech CTME Kit (on request)



## 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 one million professionals and 2000 corporate training organizations have harnessed our award-winning programs to achieve their career and business goals.



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# Program Eligibility Criteria and Application Process

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Those wishing to enroll in the Post Graduate Program in Full Stack Web Development, in collaboration with Caltech CTME, will be required to apply for admission.

## Eligibility Criteria

For admission to this Post Graduate Program in Full Stack Web Development, candidates:

- ✔ Should have a Bachelor's degree in any discipline with an average of 50% or higher marks
- ✔ Require basic programming knowledge
- ✔ Do not require prior work experience



## Application Process

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



### 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 Full Stack Web Development.



### 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.



### 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

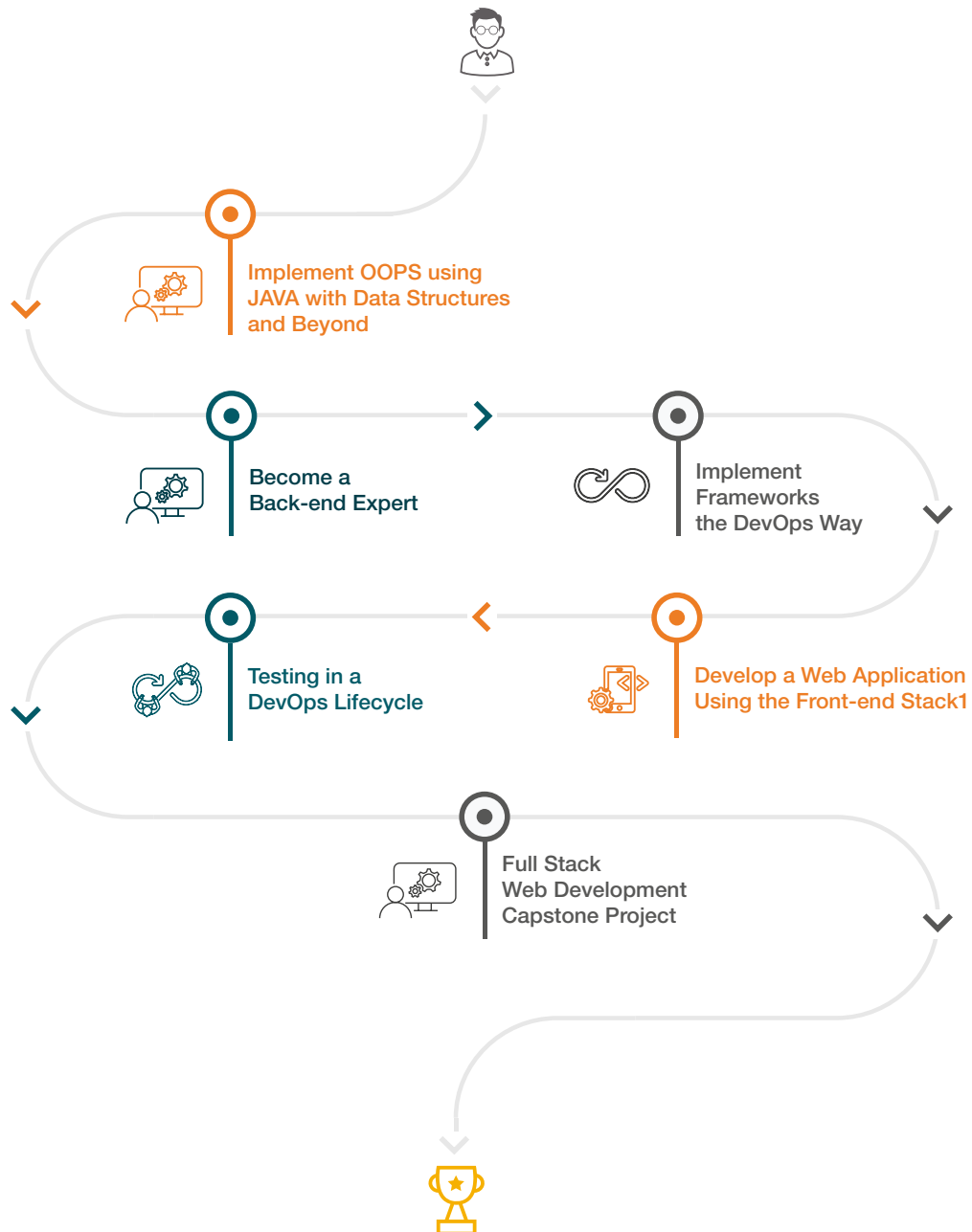
We have a team of dedicated admissions counselors who are here to help guide you in the application process and related matters.

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



# Learning Path



# Program Outcomes

At the end of this Post Graduate Program, you will:



Master software programming concepts—the basic building blocks of designing great apps



Become an agile practitioner with the ability to work on an ongoing industry project quickly



Build awesome front-end features



Architect scalable back-end infrastructure



Choose your own stack as per the requirements and delivery timeline



Test features with minimal effort and deploy features seamlessly to build a production-ready industry application from scratch

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## Who Should Enroll in this Program?

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This program caters to a wide audience, from those who are hoping to enter the industry to those who already have some experience and aspire to become full stack web developers.

The following are the few professional profiles that are ideal students for this course:

- ✓ New graduates who are ready to take the plunge into the job market
- ✓ Developers who are working in front-end or back-end development and want to shift to full stack web development
- ✓ Test engineers, system engineers, and others who want to make a career shift to development

## STEP

1

2

3

4

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# Implement OOPS Using JAVA with Data Structures and Beyond

Revisit the basics of software development with this introductory phase of our Full Stack Web Development program. Learn Agile and Scrum methodologies to deliver projects on time, and learn the building blocks of Java data structures and their application in object-oriented programming. Develop a comprehensive understanding of GIT to manage version control systems; and Maven to manage project dependencies.

## Key Learning Objectives

- ✓ Learn the underlying principles of Agile and Scrum
- ✓ Gain an understanding of Git, GitHub, and Git Rebase
- ✓ Learn about Java and its basic concepts such as methods, constructors, strings, inheritance, multi-threading, and arrays

## Course curriculum

- ✓ Lesson 01 - Agile Scrum Foundation
- ✓ Lesson 02 - Git
- ✓ Lesson 03 - Core Java Training
- ✓ Lesson 04 - Data Structures and Algorithms
- ✓ Lesson 05 - Maven

# Become a Back-end Expert

## STEP

1

Learn all aspects of back-end technologies by acquiring in-depth skills of SQL, Java servlets, and the relational database ORM with Hibernate. Learn to connect databases with JDBC and gain an understanding of RESTful web services.

2

## Key Learning Objectives

- ✓ Gain an understanding of servlets and basics of SQL including DDL and DML
- ✓ Learn JDBC, JSP, REST, and Hibernate in depth

3

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## Course curriculum

- ✓ Lesson 01 - Java Certification Course
  - a.) Java Servlet
  - b.) Java Server Pages
  - c.) Hibernate
  - d.) Spring
- ✓ Lesson 02 - SQL Training
  - a.) Relational Databases
  - b.) Querying
  - c.) Joining Tables
  - d.) Creating Databases and Adding Business Logic



# Implement Frameworks the DevOps Way

## STEP

1

Develop advanced UI skills with HTML and CSS, and build 3-tier applications with practical front-end features using the Spring framework, Angular, JUnit5, and SoapUI. You will also get to learn how to deploy continuous integration and automation using Jenkins.

2

3

## Key Learning Objectives

- ✓ Learn the basics of the Spring framework, including its architecture
- ✓ Handle exceptions using Spring Boot
- ✓ Build RESTful web services
- ✓ Understand the JUnit 5 platform and architecture and SoapUI features
- ✓ Deploy continuous integration and automation with Jenkins Pipelines

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## Course curriculum

- ✓ Lesson 01 - Spring 5.0 Core Training
- ✓ Lesson 02 - Master Hibernate and JPA with Spring Boot in 100 Steps
- ✓ Lesson 03 - DevOps: CI/CD with Jenkins Pipelines, Maven, and Gradle

# Develop a Web Application Using the Front-end Stack

## STEP

1

Create industry-standard applications and websites using the front-end stack technologies such as HTML, CSS, JavaScript, and Angular. Employ a range of data types to handle your applications efficiently using MongoDB.

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## Key Learning Objectives

- ✓ Learn HTML, CSS, Javascript, Typescript, Angular, and MongoDB
- ✓ Configure Jasmine, test source codes, and test your Angular application

## Course curriculum

- ✓ Lesson 01: Front-end Web Developer Masterclass using HTML, CSS, and JavaScript
- ✓ Lesson 02: Build Real-world Websites from Scratch Using HTML and CSS3
- ✓ Lesson 03: Full JavaScript Masterclass Course: ES6 Modern Development
- ✓ Lesson 04: Introduction to Typescript
- ✓ Lesson 05: Advanced Chef Angular Training
- ✓ Lesson 06: MongoDB Developer and Administrator Certification Training

# Testing in a DevOps Lifecycle

## STEP

1

Gain a comprehensive understanding of automation testing and integration with Selenium WebDriver. Learn how to create seamless development and production environments using containerization with a widely used tool, Docker, and manage your applications on Amazon S3 servers.

2

## Key Learning Objectives

- ✓ Understand WebDriver basics and its architecture
- ✓ Test with Selenium using TestNG
- ✓ Learn ELK Stack and Kibana monitoring tool
- ✓ Develop Your Knowledge of AWS and its services such as EC2, IAM, S3, EBS, and VPC
- ✓ Build and deploy industry-standard web applications with Docker

4

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## Course curriculum

- ✓ Lesson 01 - Learning ELK Stack 6.0
- ✓ Lesson 02 - Introduction to AWS
- ✓ Lesson 03 - Docker for the Absolute Beginner: Hands-on

# Full Stack Web Development Capstone Project

## STEP

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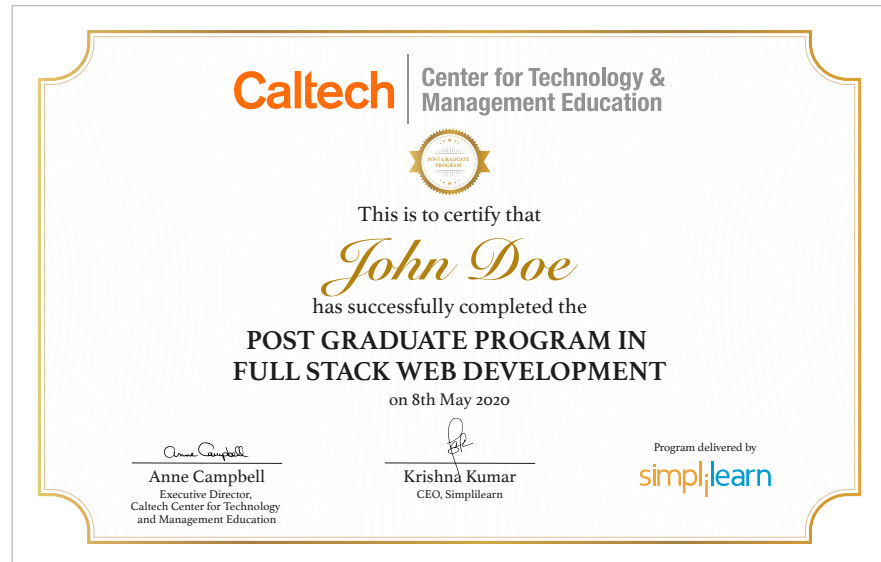
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The Full Stack Web Developer Capstone project will introduce you to real world applications. You will be given a choice among industries such as e-commerce, food delivery, entertainment, and healthcare. Comprehensive mentoring will guide you while you work on challenging problems that these industries face today. You will work on an original problem from scratch and learn how to apply your skills in an industry-specific context. The Capstone project helps to create a portfolio which will speak for your skills to a wide audience including prospective employers.

## Full Stack Web Development Master Classes – *Caltech CTME*

Attend an online interactive masterclass conducted by an instructor from Caltech CTME and gain insights about advancements in full stack web development. Understand how the most technologically-advanced companies today are developing new technologies.

# Certificates



Upon completion of this Post Graduate Program in Full Stack Web Development you will receive the Post Graduate Certification from Caltech CTME. 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 full stack web development.



# Advisory Board Members



## Rick Hefner, Ph.D.

Program Director, Caltech Center for Technology & Management Education

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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.



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