



PROFESSIONAL CERTIFICATE IN CODING: FULL STACK DEVELOPMENT WITH MERN

Gain hands-on coding skills, for a competitive market edge.

Delivered in collaboration with



Overview

Technology is the underpinning of successful companies today. As technology infiltrates every sector and every department within organizations, the demand for skilled coders to help make it all work is skyrocketing. In fact, employment for software developers is projected to grow 22% from 2019 to 2029, a much faster rate as compared to just 4% growth across all occupations.

A growing number of companies are hiring web developers, software engineers, and other technology workers who use technical skills to streamline their operations and leverage the power of technology within their organizations.

Their biggest challenge? Talent.

PRICE

USD 6,950

DURATION

32 weeks, online
(excluding break weeks)
15-20 hours per week

In the world of software development, one increasingly popular role is full-stack developer. Simply put, a full stack developer handles the entire product build-out, including the development on the client-side (front-end) and the server-side (back-end) of software. Full-stack developers work with the front-end software the client interacts with, as well as the coding and structuring of the server end. Job recruiters are aggressively recruiting for these types of positions, as full-stack developers deliver a lot of value and flexibility to an organization.

MIT xPRO's online learning programs leverage vetted content from world-renowned experts to make learning accessible anytime, anywhere and solve this challenge for developing technical professionals.

The MIT xPRO Professional Certificate in Coding is an immersive full-stack coding program offering personalized feedback, live weekly office hours with course leaders, and the opportunity to develop a GitHub portfolio for potential employers.

Take the next step to launch your software development career.

USD 108,676

The national average salary
for a Full stack developer
in the United States

(Source: Indeed 2021)

Program Highlights



Earn a certificate and 48 Continuing Education Units (CEUs) from MIT



Insights and coding demos from renowned MIT faculty



Job-ready coding skills to compete in a high-growth field



GitHub portfolio to share with potential employers



One-on-one career support from Emeritus and introductions to hiring partners for eligible participants

Program Experience



45+ hours
of pre-recorded
MIT faculty videos



5+ hours
of live mentorship
and career support



8 hours
of optional career
development
activities



19 career development
video lectures covering
30 career topics

Sample Weekly Program Planner

Learners should expect to dedicate a minimum of **15-20 hours** per week to the program.



3 hours of recorded video lectures
with faculty



4 hours of rigorous, graded assignments
to apply and reinforce lecture material



4 hours of interaction with program
learning facilitators



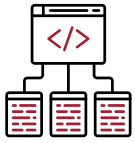
3 hours of self-study and
practice exercises



1 hour of engaging group discussion with
peers to exchange and generate ideas

Tools and Resources in Program

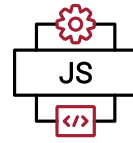
The MERN stack is a popular JavaScript stack used for a smooth, ultra-efficient development process. MERN consists of four different open-source components: MongoDB, Express, React, and Node.js. These components provide the end-to-end framework support for developers. MIT faculty believe that using MERN (with ReactJS) is the best stack for this course, as React is easier to use given it has a pre-built UI library. The program uses these tools and resources:



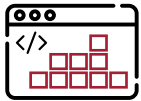
MERN Stack (MongoDB, ExpressJS, React and NodeJS)



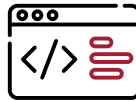
Airbnb Style Guide for JavaScript



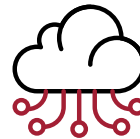
Mozilla Developer Network for JavaScript



Docker Containers



DevOps



Cloud

4th

Ranking of the Full stack engineer in the emerging jobs report from LinkedIn

(Source: LINKEDIN 2020 EMERGING JOBS REPORT)

Who Is This Program For?



Career Launchers: early career professionals wanting to start a career in a high-growth field and gain exposure to the full development lifecycle as the launch point.



Career Builders: professionals ready to build on existing skills in coding, to formalize training, and earn a valued certificate.



Career Switchers: mid- or later career professionals looking to switch into software development from another field, such as marketing, sales, operations, or any other field.

There are no prerequisites for this program, though a capacity for technical concepts is recommended.

PREPARE FOR THESE POTENTIAL JOB TITLES

- Web Developer
- Front End Developer
- Full-stack Developer
- Software Developer

28.7
Million

Projected Worldwide population of professional developers by 2024, an increase of 4.8 million from 2019

(Source: EVANS DATA CORPORATION)

Program Schedule

This program is designed to prepare you with the skills you will need to start or continue your career in web and application development. High level learning outcomes for this program include:

- Build, test, and deploy a web application using the MERN stack
- Build, test, and deploy APIs
- Build, test, and deploy a front-end web application using React
- Setup Continuous Integration (CI) and Continuous Delivery (CD) pipelines to deploy a React application
- Present a GitHub portfolio of your work to potential employers

Module 0

Orientation

The first week is an orientation module. You will have access to the learning platform from the program start date. There is no teaching, all the content is pre-recorded.

Module 1

Web Development

Key Takeaways

- Explain key web programming concepts
- Build web applications using Javascript, HTML, and CSS
- Design and code user interactions on web pages
- Design and implement UI components for web applications
- Define and breakdown modern software development lifecycle processes
- Set-up code management tools such as GitHub

Week 1: Setting up Your System

Week 6: Callback Functions

Week 2: Foundations 1: Computational Thinking

Week 7: Introduction to Testing, GitHub, and the DOM

Week 3: Foundations 2: Mental Model of Computing Operations

Week 8: Styles and Bootstrap

Week 4: Introduction to Javascript

Week 9: Asynchronous Code

Week 5: Functions: Array Manipulation and Scope

Week 10: Introduction to Cybersecurity and Recursion

Module 2

Front-End Development and React

Key Takeaways

- Build, test, and deploy a React application
- Explain key React concepts such as JSX and Hooks
- Design and build UI components using the React framework

Week 11: Introduction to JavaScript ES6

Week 16: Tic-Tac-Toe Exercise With React

Week 12: Introduction to React

Week 17: Working with React Components

Week 13: Introduction to JSX

Week 18: Bad Bank Exercise

Week 14: Working with Lists in React

Week 19: Shopping Cart Exercise

Week 15: Working with Simple Components

Week 20: Testing

Module 3

Back-End Development

Key Takeaways

- Build a secure full-stack web application using the MERN stack
- Create a backend API with Express
- Integrate React with a backend Express API
- Explain the interactions between the different components of the MERN stack
- Explain key cloud concepts related to modern web application development
- Deploy a full stack solution using DevOps pipelines
- Explain key DevOps concepts for Continuous Integration (CI) and Continuous Delivery (CD)

Week 21: Application Servers & Storage

Week 27: Architectural Patterns

Week 22: Application Servers & Storage

Week 28: Architectural Patterns

Week 23: Containers and Cloud Basics

Week 29: DevOps & Testing

Week 24: Containers and Cloud Basics

Week 30: DevOps & Testing

Week 25: APIs

Week 31: Capstone Week

Week 26: Security

Week 32: Capstone Week

Note: Break weeks are included to cover project assignment work and prepare for the upcoming module.

CODING DEMOS

Hundreds of coding demos giving you hands-on experience and guidance on coding in your own environment.

CODING ASSIGNMENTS

Coding assignments are integrated into the learning platform to allow you to practice building composite skills (like how to write a callback function or a loop) to prepare you for the portfolio and capstone assignments.

Portfolio Projects

Each module culminates with a GitHub portfolio project where you will create a website using the technologies of that portion of the course. You will receive personalized feedback from Course Leaders and share it on your GitHub repositories, securing a market-ready portfolio to share with potential employers.

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|-----------------------------------|---|---|
| Module 1 | Module 2 | Module 3 |
| Create a GitHub portfolio website | Create a website using React components | Capstone project that is a fully functional website with MERN stack |

Faculty



JOHN R. WILLIAMS

Professor of Information Engineering in MIT
Department of Civil and Environmental
Engineering

John Williams holds a BA in Physics from Oxford University, an MS in Physics from UCLA, and a Ph.D. in Numerical Methods from University of Wales, Swansea. His research focuses on the application of large-scale computation to problems in Cyber-Physical security and energy studies. He is director of MIT's Geospatial Data Center and from 2006-2012, was Director of the MIT Auto-ID Laboratory, which invented the Internet of Things.

He is author or co-author of over 250 journal and conference papers, as well as the book, RFID Technology and Applications. He contributed to the 2013 report for the UK Office for Science Foresight Project- The Future of Manufacturing.

Alongside Bill Gates and Larry Ellison, he was named as one of the 50 most powerful people in Computer Networks. He consults to companies including Accenture, Schlumberger, SAP Research, Microsoft Research, Kajima Corp, US Lincoln Laboratory, Sandia National Laboratories, US Intelligence Advanced Research Projects Activity, Motorola, Phillip-Morris Inc., Ford Motor Company, Exxon-Mobil, Shell, Total, and ARAMCO.

His international collaborations include HKUST and PolyU Hong Kong, Cambridge University-UK, Imperial College of Science and Technology-UK, Malaysia University of Science and Technology (MUST), KACST Saudi Arabia, Masdar Institute of Science and Technology (Abu Dhabi.)

He organized the first Cyber-Physical Security Conference in the UK (2011) and along with Dr. Sanchez, he runs the MIT Applied Cyber Security Professional Education summer course. At MIT he teaches courses Architecting Software Systems (MIT 1.125) and Engineering Computation and Data Science (MIT 1.00/1.001).



ABEL SANCHEZ

Research Scientist and Executive Director of
MIT's Geospatial Data Center

Dr. Abel Sanchez holds a Ph.D. from the Massachusetts Institute of Technology (MIT). He is the Executive Director of MIT's Geospatial Data Center, architect of "The Internet of Things" global network, and architect of data analytics platforms for SAP, Ford, Johnson & Johnson, Accenture, Shell, Exxon Mobil, and Altria. In cyber security, Dr. Sanchez architected impact analysis of large-scale cyber-attacks designing Cyber Ranges for the Department of Defense (DOD).

In password security, Dr. Sanchez led the design of a password firewall (negative authentication) for the Intelligence Advanced Research Projects Activity (IARPA) agency. In machine learning, addressing fraud detection, Dr. Sanchez designed a situational awareness framework that exploits different perspectives of the same data and assigns risk scores to entities for Accenture.

He led the design of a global data infrastructure simulator, modeling follow-the-sun engineering, to evaluate the impact of competing architectures on the performance, availability, and reliability of the system for Ford Motor Company. He has been involved in developing e-learning software for Microsoft via their I-Campus Program and with establishing the Accenture Technology Academy, an online resource for over 200,000 employees. He has 10 years of experience with learning management systems and has made deployments in America, Asia, and Europe. He teaches MIT courses on cybersecurity, engineering computation, and data science and has produced over 150 educational videos.

Career Preparation and Guidance

Stepping into a career in software and web development requires a variety of skills, both hard and soft. This course offers you guidance for navigating a career path into tech, including crafting your elevator pitch and communication tips. These services are provided by Emeritus, our learning collaborator for this program. The program support team includes course leaders to help you reach your learning goals. The primary goal is to give you the skills needed to be prepared for a job in this field, however, job placement is not guaranteed.

There is a career preparation aspect of this course, elements include:



Crafting your elevator pitch



Navigating your job search



LinkedIn profile tips



Interview tips and preparation



Resumes/cover letters



Negotiating salary

Career exercises focused on launching a career as a developer:



Building your personal brand and promoting your skills



Reflecting on your skills to learn how to troubleshoot and learn more quickly



Communicating technical concepts to non-technical colleagues



Job search and interviewing for developer positions



Understanding the roles and workflow of Agile development

Learning Facilitators



LETICIA ESCANCIANO

Full Stack Developer at Factorial HR

Leticia brings a passion for all things tech. She currently works as a full stack developer and previously held the position of CTO at Madrid-based start-up Sportmadness for two years, where she was in charge of building their digital product.



PATRICK ANDRE

Director of Engineering at Forbes

Patrick is a technology leader with over 15 years of experience managing site/application development, product management, architecture, product development, process improvement, resource allocation, and digital strategy. He has a proven track record, delivering web products/solutions on time and on budget.



PUNEET SARASWAT

Senior Infrastructure Engineer at Unfinished

Puneet has over nine years of experience, ranging from core algorithmic research to full stack development, leading projects from inception to delivery. He previously worked with Schlumberger for over eight years, starting from research and development in the area of seismic wave modeling, inversion, and earth-model building.



MAHA MAHMOOD

Associate Success Engineer at Acquia

Maha brings a trifecta of skills - analytical, creative, and technical - developed over more than a decade of holding positions in consumer products and EdTech markets. Her varied experiences in marketing and web development give her the ability to be adaptable and innovative.

Note: These are some of our learning facilitators who are also prominent industry experts.

Participant Testimonials

"I like everything - the videos, the quizzes, the projects. Also, the Learning Facilitators seem very enthusiastic and engaged."

– Dennis Sponer, Founder, ScripNet

"I liked that we covered so many topics in detail. I also really enjoyed the portfolio project at the end! I had never built a website before, but I felt well equipped to do so and was surprised how much fun it was trying out different layouts and putting things together."

– Andrew Thomas, Teacher, MI

"I liked the constant availability of instructor support via office hours, and quick responses to Q&A."

– Erica Moslander, Operational Excellence Coordinator, Betterview Marketplace, Inc

"I feel like I've learned so much. The coursework was challenging and the final project was a great experience in tying together the module."

– Viren Desai, VP Strategy & Finance, Triple Crown Resources, LLC

"Overall, I enjoyed taking a deep dive into all areas of code. I really enjoyed creating the Portfolio...especially when I reflect on the first month when we were instructed to push a photo and name to our GitHub page...I cannot believe how far we have all come."

– Meghan Nieves, MDM Engineer, Forward Thinking Technology Solutions

"My peers were very collaborative and helpful. The portfolio project really forced a lot of learning."

– Matthew Elliott, Product Owner, Infobelt

Financing Options

We want to make sure that the Professional Certificate in Coding: Full Stack Development with MERN is an affordable option for all. This is why we offer you many different ways to pay for the program.

Loan Partners (For US Residents)

Sallie Mae Monthly payments starting at USD 25

- Visit the [Sallie Mae application portal](#)
- Fill in your basic details and proceed to the loan application page.
- At the time of loan application, please select '**Student and Career Training School**' when prompted
- Choose from fixed repayment, interest-only repayment, and deferred payment options and submit your application
- Our program advisors will contact you for a confirmation on your loan application*
- After confirmation, we will certify your loan. You will receive a welcome email with login instructions from notifications@instructure.com within 3 business days

Ascent Funding Monthly payments starting at USD 40

- Visit the [Ascent Funding application portal](#)
- Enter your email address and select the 'Professional Certificate in Coding: Full Stack Development with MERN' option from the dropdown list
- Choose from immediate repayment, interest-only repayment, and deferred payment options and submit your application
- Our program advisors will contact you with a confirmation on your loan application*
- After confirmation, we will certify your loan and you will sign the final disclosures.
- You will then receive a welcome email with login instructions from notifications@instructure.com within 3 business days

Financing options also available exclusively for UK residents

Flexible Payment Options (For All Countries)

- Choose to make your payment in two, three, or six [installments](#) for higher flexibility. Monthly payments start as low as US\$1,166
- Complete your application for the [Professional Certificate in Coding: Full Stack Development with MERN](#) and enroll for the program

You can opt for any one of the financing options to cover up to the full cost of the program tuition. If you are considering financing your program through one of our partners, the enrollment process can only be completed with the assistance of your program advisor or by calling +315-538-6867.

*Due to processing time, the loan application should be submitted no later than four business days prior to the enrollment deadline.

Certificate

Get recognized! Upon successful completion of this program, MIT xPRO grants a certificate of completion to participants and 48 Continuing Education Units (CEUs). This program is graded as a pass or fail; participants must receive 75% to pass and obtain the certificate of completion.

After successful completion of the program, your verified digital certificate will be emailed to you, at no additional cost, with the name you used when registering for the program. All certificate images are for illustrative purposes only and may be subject to change at the discretion of MIT.



About MIT xPRO

MIT xPRO's online learning programs leverage vetted content from world-renowned experts to make learning accessible anytime, anywhere. Designed using cutting-edge research in the neuroscience of learning, MIT xPRO programs are application focused, helping professionals build their skills on the job. To explore the full catalog of MIT xPRO courses and programs, visit: xpro.mit.edu.

About Emeritus

MIT xPRO is collaborating with online education provider Emeritus to deliver this online course through a dynamic, interactive, digital learning platform. This course leverages MIT xPRO's thought leadership in engineering and management practice developed over years of research, teaching, and practice.

Easily schedule a call with a program advisor from Emeritus to learn more about this MIT xPRO program.

SCHEDULE A CALL

You can apply for the program here

APPLY



CONNECT WITH A PROGRAM ADVISOR

Email: mit@emeritus.org

Phone: +1-315-538-6867

Delivered in collaboration with

