SOFTWARE DEVELOPMENT BOOTCAMP

University of Wisconsin–Madison

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College of Engineering
UNIVERSITY OF WISCONSIN–MADISON

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About the
Software Development Bootcamp

Software developers are valuable for a variety of reasons, including their ability to address all points of a development project, work on back-end and front-end development, reduce the cost of projects, support all team members, and more.

From mobile banking to connected homes to autonomous vehicles, nearly every aspect of our lives is now dependent on lines of code. Whether it's a virtual assistant, smart insulin pump, or any other web-connected device, it needs coded instructions to work.

Businesses need builders, thinkers, and leaders. In this program, you will gain the tactical software engineering principles, soft skills, problem-solving, and communications skills to become a successful software engineer and an asset to any team.

The goal of the **Software Development Bootcamp** is to take you from little or no experience to a ready-to-hire developer by providing you with the most up-to-date skills and hands-on experience companies look for in qualified software developers. software developers have many advantages over other job seekers because they can organize an entire project, see the big picture, and work on a variety of programming assignments. From designing impactful user interfaces to server-side programming to database applications, software developers can help with both the design and functional aspects of any project.

The skills required in the professional landscape are evolving. The workforce needs more people who can work responsibly with data and build applications that are accessible to everyone. Technological advancements are moving quickly and there simply aren't enough people equipped with the skills needed to fill the open software developer positions.

To address this massive deficit in the workforce, the University of Wisconsin–Madison is offering the **Software Development Bootcamp**. Our industry-leading instructors and program developers work routinely to discover the skills gap in the workforce and include those skills in the Software Development Bootcamp curriculum.* This allows the needs of the market to drive the content of the curriculum and the experience that closely aligns with the challenges current businesses face.

* We reserve the right to amend the course material according to market demand and to maintain relevance in the industry.

Preparing You for a
Software Development Career

The accelerated **Software Development Bootcamp** at the University of Wisconsin–Madison is built for those from any professional background who have a strong affinity for technical solutions, enjoy aspects of conceptual and visual design, and seek creative ways to solve problems. The program provides you with the skills and hands-on experience companies seek in qualified software developers and coding professionals.

Upon program completion, you will be qualified for a variety of software development and coding roles,* including:

| Software Developer

| Software Engineer

| MERN Stack Developer

| Front-End Developer

| Web Developer

| Application Engineer

| Software Programmer

| Python Developer

| Back-End Developer

* Job titles listed do not necessarily reflect entry-level positions.

According to the US Bureau of Labor Statistics, jobs for web developers are expected to increase by 23% in the 10-year period spanning from 2021 through 2031.

What You Will Learn

Web Design

| Front-End Technologies: HTML, CSS, and JavaScript

| Web Accessibility Best Practices

| CSS Frameworks

| User Experience

| User Interface Design

| Agile Software Methodology

| Responsive Design

Web Development

| Back-End Frameworks

| Node.js and Express

| API Development

| API Documentation

| API Best Practices

| React Web Applications

| Data Modeling

| SQL and NoSQL

Software Engineering

| Cybersecurity

| Cloud Architecture

| Python Programming

| DevOps

| TypeScript

| Sass

| Server Deployments

| Serverless Deployments

| Testing Methodologies

| Platform as a Service (PaaS)

What You Will Build

| Beautiful and intentional user interfaces that follow best practices for accessibility and design

| Dynamic applications that respond quickly to user interaction and persist data using RESTful APIs and both SQL and NoSQL databases

| Applications that use modern browser technology to connect users in real time

| Secure applications that protect user data using a variety of techniques

| Cloud-deployed applications that can scale to handle large user bases

The accelerated programs powered by ThriveDX help reskill and upskill learners in today's fast-growing digital economy. With over a decade of experience as the world's premier digital skills and cybersecurity education provider, ThriveDX works with top-tier academic institutions, government organizations, and global enterprises to offer advanced workforce and professional development programs in digital technology.

Program
Structure

The **Software Development Bootcamp** at the University of Wisconsin–Madison aims to provide you with the knowledge base and practical experience you need to obtain a role in the software programming field. The curriculum integrates real-world projects and training exercises with software engineering theory to provide practical experiences, tools, and insights you need to succeed as a professional developer.

In the Software Development Bootcamp, you will attend lectures, take part in individual and group exercises, and gain access to virtual labs and real-world projects that teach you how to create user experiences through client- and server-side development best practices.

The Software Development Bootcamp was designed to meet the needs of working professionals. The program offers flexible evening and weekend course schedules and consists of a total of 400 in-class hours.

30-Hour Introductory Course

This unique **Introductory Course** provides you with a taste of the industry and serves as a chance to make sure software development is the right career for you. The course includes theory and practice of coding, as well as a short exam covering the fundamentals of the industry.

Experiential Learning

This hands-on program provides knowledge of industry tools, methods, and coding languages, including:

| HTML5, CSS3, and JavaScript

| Node.js and Python

| RESTful APIs

| GitHub and DevOps

| Database Management (PostgreSQL, MongoDB)

| React, Redux, and TypeScript

| MERN Stack (Mongo, Express, React, Node.js)

| SQL and Data Modeling

| Python Programming

| Object-Oriented Programming

| Functional Programming

* Certification exams are not conducted as part of the program and require additional costs not included in tuition. While the curriculum provides the knowledge needed to perform well on industry exams, the University of Wisconsin–Madison Software Development Bootcamp is not a test preparation program, where the primary focus is your performance on the exam. This program is designed to teach in-demand knowledge for today's workforce.

Career Outcomes

The goal of Career Outcomes is to ensure you have the best chance possible when applying for a position in software development and coding. With a full self-study curriculum, Career Outcomes can help you build your professional brand, LinkedIn profile, and technical resume; shape your job search strategy; hone your interview skills; and more. Career coaches offer additional one-to-one support when you need it. You also have exclusive access to a variety of live virtual events throughout the program.

Portfolio Projects

You will complete three experiential training projects that you can showcase on your personal portfolio website when applying to jobs in the field:

| A front-end, in-browser game that demonstrates your skills in HTML, CSS, and JavaScript

| A MERN stack project that demonstrates software ability, including React on the front end, Node.js/Express on the back end, and persistent data in a MongoDB NoSQL database

| A full-stack project that utilizes Python or Node.js on the back end and showcases skills of your choice
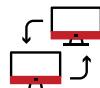
Certification Preparation

The Software Development Bootcamp prepares you for a number of globally recognized engineering and developer certifications.*

| AWS Certified Developer

| Microsoft Azure Engineer

| Google Cloud Developer

Teaching
Methodologies

Classes are conducted in live, synchronous, virtual classroom environments. This allows for a program that is nimble and adaptable, much like the industry itself. This provides you with the opportunity to learn in an environment that is aligned with the profession and allows you to balance education with your other responsibilities. The program applies foundational elements from advanced teaching methodologies that include:

Advanced Remote Education Technologies

You can take advantage of industry-leading remote technologies that increase the comprehension level of course modules. Being able to instantly message instructors, virtually raise your hand during class, and collaborate with peers via remote workspaces ensures you have the tools you need to learn even the most intricate concepts.

Instruction by Experts in the Field

Classes are taught by instructors who are leaders in the industry and who bring a wealth of knowledge and experience to the learning environment. You will benefit from instructors' current industry expertise as well as from their unique insiders' understanding of the fast-paced field of software development.

Synchronous, Virtual, Live Classrooms

Online classes are held by expert instructors and occur on a regular basis with real-time interaction. Lessons stem from top-tier instructional methodologies and are enhanced by cloud-based chat software that allows live, hands-on interactions between you and your instructors.

Live Virtual Events

Career Outcomes offers you exclusive access to a variety of live virtual events that include alumni panels, industry-focused discussions with subject matter experts, networking sessions, career readiness talks, and pop-up company info sessions with potential employers.

Hands-on Projects & Campaigns

With a number of monthly projects, you will have numerous opportunities to practice your digital skills in a virtual environment alongside your instructors to ensure in-depth comprehension. You can also apply the skills gained in your virtual lessons to real-world scenarios and gain extensive experience solving problems while obtaining feedback from industry experts.

On-Demand Library & Bonus Training Access

You will have 24/7 access to 100+ hours of continuously updated supplemental material, previously recorded live classroom sessions, and optional training modules on the Kontra platform. Unique to this program, Kontra's modules focus on application security training utilizing real-world scenarios to teach the skills needed to write code that will pass the pen-testing segment of code reviews.

Online Q&A Sessions with Instructors

Through virtual, instructor-led question and answer sessions, you can request clarification on challenging concepts or ask for assignment feedback from instructors. This community environment promotes the kind of teamwork and collaboration that translates outside of the classroom.

Extended Virtual Office Hours

You are encouraged to prepare your own questions regarding lessons, as well as any concerns about your progress in the course.

Commitment to
Success

To ensure a quality match between you and the program, and to maintain the competitive integrity of each individual, a revolutionary educational model is rooted in an admissions process that assesses your practical aptitude in your field of interest alongside your theoretical knowledge of the subject.

You will participate in a 30-hour Introductory Course focused on introductory material, hands-on training, and critical thinking to provide you with a taste of the field and the experience you need to be sure software development is the right career path for you. At the end of the Introductory Course, you will take an assessment exam and evaluate your progress with an admissions advisor to determine if the program is suitable for you.

The Five-Step
Developer Education Process

The Five-Step Developer Education Process is the result of over a decade of proven research conducted by global industry experts. It combines unique teaching methods and curricula that ensure you receive the highest-quality education possible with the aim of helping every individual complete the program with the competitive skill set today's job market demands.

01 Talk to Us

Prospective learners set up a free consultation with an admissions advisor to assess their aptitude in the field and determine appropriate placement in one of the Software Development Bootcamps.

02 One-on-One Meeting

Each prospective learner meets with their assigned admissions advisor to further discuss the program, career expectations, and future job opportunities. Meetings can be virtual or on the phone.

03 Introductory Course

This 30-hour course is designed to teach you the fundamentals of coding and software development. After the course, you will take a summary exam and have a one-on-one assessment with an admissions advisor to examine your future in the program.

04 The Program

The ThriveDX-powered Software Development Bootcamp curriculum is developed and refined by experts in the field. The program provides immersive, hands-on, experiential training that is centered on coding languages and knowledge transfer methodologies.

05 Career Outcomes

Career Outcomes services are built into the program and provide interview training, advice on personal branding, job search strategy tips, professional networking opportunities, and more. Career coaches offer one-on-one feedback on your professional resume and LinkedIn profile. This integrated support increases your chances of success as you prepare to enter the field of software development.*

* Career Outcomes services are consultation-based only and do not guarantee job placement.

Prerequisites

| You are not required to have a background in any related field but should be prepared to learn technical concepts at a rapid pace.

| Professional evaluation

Program Flow

Web Design — 01 02 03 — Software Engineering

Web Development

The Software Development Bootcamp is divided into three parts. The first group of courses covers the fundamentals of development and focuses mainly on the front end. The second part focuses on what is referred to as the MERN stack, one of today's most popular technologies for building a single-page app. The third section focuses on Python, a powerful programming language used for a variety of purposes, including web applications and beyond.

Part 1: Web Design

In these courses, you will learn in-depth web development concepts and techniques. You will also gain knowledge of the basics of web development—including HTML, CSS, programming with JavaScript, and source code management with Git—and practice using industry tools such as GitHub.

In the Software Development Bootcamp, you will learn the principles of web development from day one. The fundamentals are taught with user experience in mind, and best practices are consistently explained in each course.

HTML & Web Accessibility
The HTML & Web Accessibility course is meant to give you a strong foundation in the building blocks of webpages, prepare you for later courses, and tie web development into current events and real-life situations.

CSS & CSS Frameworks
The CSS & CSS Frameworks course aims to give you the ability to style the layouts you learned to create in HTML & Web Accessibility. This course covers a wide variety of techniques for styling an interface for the web, beginning with foundational concepts and common practices for writing CSS by hand and concluding with the usage of related tools that style more efficiently.

User Experience & User Interface Design
The User Experience & User Interface Design course introduces the research skills that you need to identify your users and the solutions you need. Learning about UX/UI will further solidify the earlier concepts of usability and accessibility.

JavaScript & Front-End Web Development
The JavaScript & Front-End Web Development course provides you with a fundamental understanding of your first programming language, practices DOM manipulation and events on front-end webpages, and introduces more advanced JavaScript topics to scaffold information in later courses.

Milestone Project 1: Browser Game
The in-browser game you will build in this milestone project allows you to demonstrate your knowledge of front-end design and development using the skills you acquired in Part 1 of the program.

Part 2: Web Development

Back-End Development & APIs
The Back-End Development & APIs course opens up the world of server-side programming and enables you to create and document custom APIs while following best practices and using industry-standard tools for testing. You will also learn to persist data using a NoSQL database (MongoDB).

React & Redux
The React & Redux course builds on the concepts of JavaScript & Front-End Web Development, teaching you to use current industry tools to build more robust user interfaces and state management.

SQL & Data Modeling
SQL & Data Modeling prepares you to use relational databases and manage data at a large scale. You will practice creating normalized data models, migrations to manage schema and content over time, and common optimization techniques for the industry.

Milestone Project 2: MERN Stack Application
In this project, you will combine the skills you acquired in Part 1 of the program with new skills from Part 2 to create a MERN stack application that demonstrates your knowledge and abilities. You will have the option to use MongoDB, Express, React, and Node.js to create a web application (React).

Part 3: Software Engineering

After gaining the practical knowledge of web development best practices, you will have an understanding of how to create fully functioning, end-to-end applications that solve business problems.

In the advanced courses in this category, you will acquire a better understanding of different programming languages and the infrastructure needed to scale. You will also learn how to implement security.

Cybersecurity
The Cybersecurity course introduces you to the fundamentals of data access management and encourages you to prioritize securing data and identifying proper and improper access to information. You will build applications to support user authentication and authorization. Discussion topics include several common security flaws and tactics to protect against them as well as encryption and hashing.

Principles of Programming with Python
The Principles of Programming with Python course is meant to boost your confidence and solidify programming fundamentals through learning a new programming language. Additionally, this course aims to make you well-rounded through delivering computer science theory and discussing useful programming paradigms and applications of programming outside of the web environment.

Advanced Topics
In the Advanced Topics course, you may learn one or more of the following topics: introductory deployment and DevOps topics, cloud computing, TypeScript, and Sass.

Milestone Project 3: Final Project
In this milestone project, you will leverage the cumulative skills you have gained in the program to create a complex application of your choice. You will be able to use Python or Node.js to create a project that utilizes one or more of the technologies covered in Part 3 of the program. This includes but is not limited to identity and access management and containerization and cloud applications.

Career Outcomes
This optional course provides you with the support and tools you need to successfully prepare to enter the field of software development. Career planning services include interview training, professional networking, and consultations devoted to perfecting LinkedIn profiles, e-portfolios, and resumes.

What's Included

Professional Networking

11 Specialized Courses

Career Outcomes Virtual Events

On-Demand Library & Bonus Training Access

Experiential Learning

3 Milestone Projects

3 Asynchronous Test Preparation Workshops

400 In-Class Hours

The ThriveDX Difference

The University of Wisconsin–Madison's Software Development Bootcamp was developed in partnership with ThriveDX (formerly known as HackerU). Originally founded in Israel, ThriveDX is one of the world's premier digital education providers with more than 15 years of global experience powering career-change programs that help adult learners join the digital economy. This program leverages industry leaders to develop and teach curriculum tailored to today's job market, including hands-on simulation labs that support individuals aspiring to build a career in technology. ThriveDX partners with many top-tier universities to offer accelerated professional development programs for learners from all backgrounds.

Industry Certifications

The University of Wisconsin–Madison Software Development Bootcamp prepares you for an exciting career in application development. To further help you stand out to employers, the program helps set you up for success with the industry's most recognized exams.[*]

Training for certification exams[**] includes one of the following:[†]

| AWS Certified Cloud Practitioner

| Microsoft Certified: Azure Fundamentals

| Google Professional Cloud Developer

With these certifications, you can continue building a career developing scalable enterprise software applications upon completion of the Software Development Bootcamp.[††]

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[*] While the curriculum covers some of the knowledge needed for industry exams, this program is not a test preparation program, where the primary focus is your performance on the exam. The program is designed to teach in-demand knowledge for today's workforce.
[**] Certification exams are not conducted as part of the program and require additional costs not included in tuition.
[†] Any test preparation session that may be provided is not mandatory and is not part of the program curriculum. Workshops are designed to provide extra resources and help for those who wish to take specific exams.
[††] You must have a minimum of one year of cumulative work experience in the specific cloud provider in order to be certified.

Program Breakdown
By Course

Course 1

Introductory Course

30
Hours

The Introductory Course is meant to provide an accurate representation of what the entire Software Development Bootcamp will teach. It gives you a short overview of the first five courses in a way that focuses on projects you can immediately begin to build to showcase your skills to potential employers.

Before taking the Introductory Course, you should have:

| A computer that can run the latest distribution of a modern-day operating system, such as MacOS, Linux, or Windows

| A typing speed of 30 WPM or better

| Basic knowledge of using computers, such as how to open programs, point and click, and navigate to a website via a web browser

| Knowledge of basic math through algebra

Topics:

| Welcome and Course Expectations

| Web Development in Context

| Choosing Your Tools

| Learning to Love Your Terminal

| Thinking Like a Coder

| Intro to Agile Development

| Intro to HTML

| Styling with CSS

| Git and GitHub

| Programming with JavaScript

| DOM Manipulation

| Project: Pseudocode in Practice

| Program Demo

| Skills Assessment

Course 2

HTML & Web Accessibility

12
Hours

The HTML & Web Accessibility course provides you with a strong foundation in the building blocks of webpages, prepares you for later courses, and ties web development into current events and real-life situations.

Topics:

| Introduction to HTML

| Containers, Tables, and Lists

| File Paths: Best Practices

| HTML Media

| Forms

| Semantic HTML and Web Accessibility

Course 3

CSS & CSS Frameworks

20
Hours

The CSS & CSS Frameworks course aims to give you the ability to style the layouts you learned to create in HTML & Web Accessibility. This course covers a wide variety of techniques for styling an interface for the web, beginning with foundational concepts and common practices for writing CSS by hand and concluding with the usage of related tools that style more efficiently.

Topics:

| Intro to CSS

| Simple Styling

| Animations and Transforms

| Responsive Layout and Flexbox

| CSS Frameworks

Course 4

User Experience & User Interface Design

12 Hours

The User Experience & User Interface Design course introduces the research skills you need to identify your users and the solutions that you need. Learning about UX/UI will further solidify the earlier concepts of usability and accessibility. Learning about agile methodology prepares you for product and time management on cross-functional, self-managing teams.

Topics:

| Introduction to UX and UI Design
| Visual Branding for the Web
| Accessibility for the Web
| Digital Layout
| Design Systems
| Introduction to UI Design Patterns
| Advanced UI Design Patterns
| Introduction to Sketch, Figma, and Adobe XD
| Workshop I
| Workshop II
| How to Present UX/UI Design
| Design Presentations

Course 5

JavaScript & Front-End Web Development

48 Hours

The JavaScript & Front-End Web Development course gives you the fundamentals of your first programming language, allows you to practice DOM manipulation and events on front-end webpages, and introduces more advanced JavaScript topics to scaffold topics in later courses.

Topics:

| Variable Declaration
| Control Flow
| Functions
| Asynchronous JavaScript
| Object-Oriented Programming with JS
| Interactive Webpages
| Dynamic Webpages
| Project: Create an Interactive Map

Milestone Project 1

Browser Game

24 Hours

This milestone project allows you to explore your skills in the areas of HTML, CSS, and JavaScript. You will be able to demonstrate your ability with DOM manipulation and connecting events in a web browser. Additionally, you will have the opportunity to design a functional and elegant user experience as you deploy the game on the web and share it with your classmates. The browser game milestone project will be formally reviewed by the instructional team in the following areas:

| User Experience
| Functionality
| Workflow
| Code Style
| Presentation

Course 6

Back-End Development & APIs

48 Hours

The Back-End Development & APIs course opens up the world of server-side programming via Node.js and Express and enables you to create and document custom RESTful APIs while following best practices and using industry-standard tools for testing.

Topics:

| Client-Server Architecture
| NPM and Node.js
| Intro to Express
| Server-Side Rendering with JSX
| RESTful Routing
| MVC Architecture
| MongoDB and NoSQL
| Mongoose and ODMs
| APIs and Documentation
| Cloud Deployment

Course 7

React & Redux

44 Hours

The React & Redux course builds on the concepts of the JavaScript & Front-End Web Development course, teaching you to use current industry tools to build more robust user interfaces and state management.

Topics:

- JavaScript Tooling
- React Fundamentals
- React Dataflow
- Styling in React
- Testing in React
- Redux Fundamentals
- React-Redux
- Advanced Redux

Course 8

SQL & Data Modeling

24 Hours

SQL & Data Modeling prepares you to use relational databases and manage data at a large scale. You will practice creating normalized data models, migrations to manage schema and content over time, and common optimization techniques for the industry.

Topics:

- History of Relational Databases
- Basic SQL
- Joins, Relationships, and Structure
- Advanced SQL
- SQL in Node.js

Milestone Project 2

MERN Stack Application

24 Hours

This milestone project uses React as the front end, Node.js and Express as the back-end API, and MongoDB (a NoSQL database) to persist data. You will use React for a web application.

Course 9

Cybersecurity

20 Hours

The Cybersecurity course introduces you to the fundamentals of access management and encourages you to prioritize securing data and identifying proper and improper access to information. You will build applications to support user authentication and authorization. Discussion topics include several common security flaws and tactics to protect against them.

Topics:

- History of Cybersecurity
- Common Attack Patterns
- Identity and Access Management

Course 10

Principles of Programming with Python

36 Hours

The Principles of Programming with Python course is meant to boost your confidence and solidify programming fundamentals through learning a new programming language. Additionally, this course aims to make you well-rounded through delivering computer science theory and discussing useful programming paradigms and applications of programming outside of the web.

Topics:

- Intro to Python Language
- Python Functions
- Python Packages and Modules
- Object-Oriented Programming
- Functional Programming
- Web Development with Python
- Data Structures and Algorithms

Course 11

Advanced Topics

24 Hours

The Advanced Topics course focuses on the exciting ways you can use technology. This course includes one or more of the following topics: Cloud certifications and an introduction to DevOps, Sass, and TypeScript.

Milestone Project 3

Final Project

24 Hours

This milestone project allows you to gain extra practical knowledge and create a portfolio project in a more specialized area of knowledge. You may choose any of the topics covered in the previous courses to delve deeper into for the purposes of a final project, and you are encouraged to pursue an area that aligns with your job-related interests.

Course 12

Career Outcomes

10 Hours

This optional course provides you with the support and tools you need to successfully prepare to enter the field of software development. Career planning services include interview training, professional networking, and consultations devoted to perfecting LinkedIn profiles, e-portfolios, and resumes.

Topics:

| Resume and LinkedIn Profile Building

| Interview Skill Building

| Job Search Strategies and the Power of Networking

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Boost your confidence and solidify programming fundamentals through learning a programming language.

Program Summary

Courses	In-Class Hours
Introductory Course	30
HTML & Web Accessibility	12
CSS & CSS Frameworks	20
User Experience & User Interface Design	12
JavaScript & Front-End Web Development	48
Milestone Project 1: Browser Game	24
Back-End Development & APIs	48
React & Redux	44
SQL & Data Modeling	24
Milestone Project 2: MERN Stack Application	24
Cybersecurity	20
Principles of Programming with Python	36
Advanced Topics	24
Milestone Project 3: Final Project	24
Career Outcomes	10
Asynchronously delivered materials and bonus training modules (not included in count of class hours)	100+ hours available
Total	**400**

College of Engineering

UNIVERSITY OF WISCONSIN–MADISON

(608) 733-6400

University of Wisconsin–Madison
College of Engineering
432 North Lake Street
Madison, WI 53706

digitalskills.wisc.edu

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