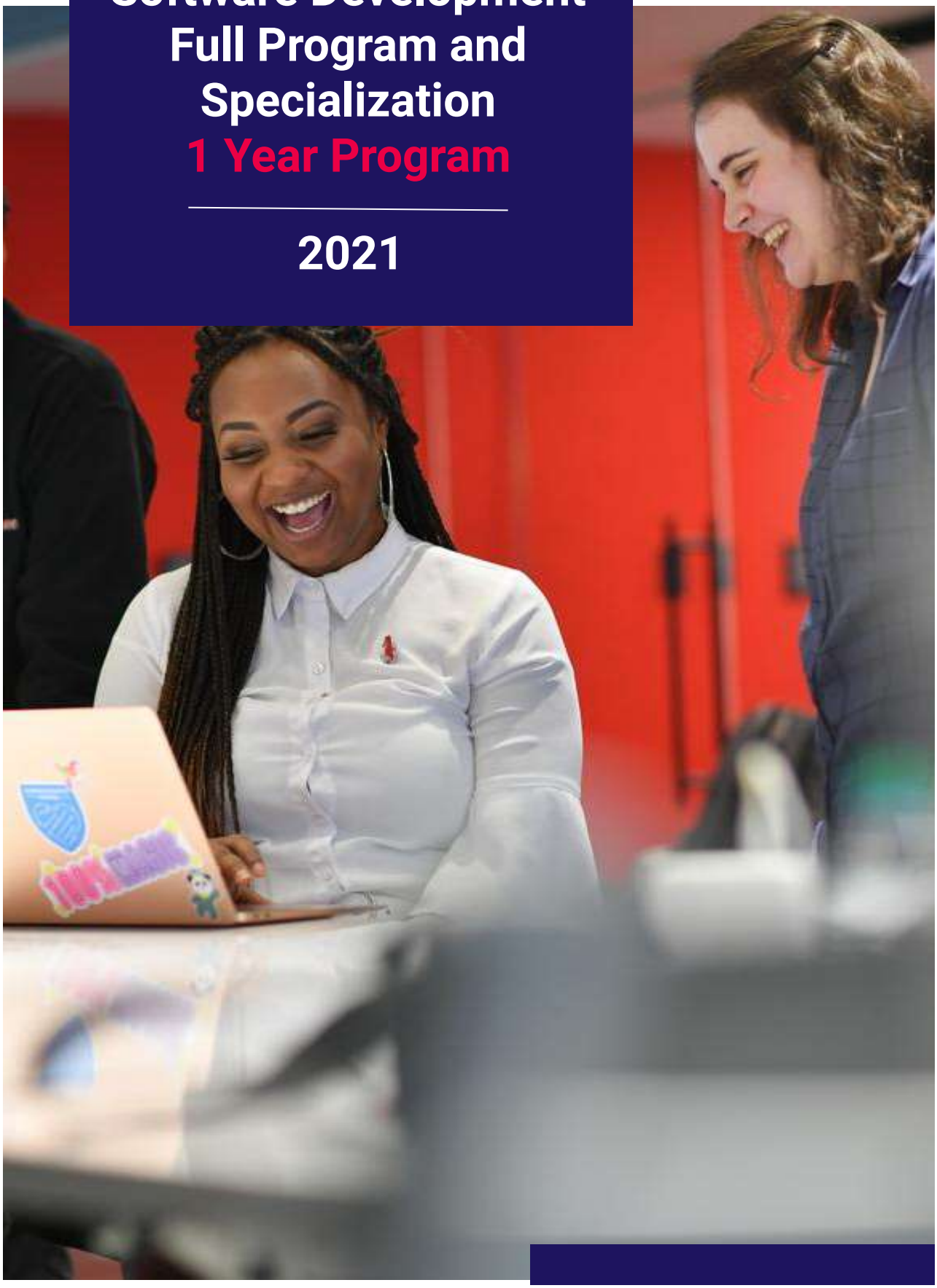
Software Development Full Program and Specialization

1 Year Program

2021



Holberton MONTEVIDEO | FUNDACIÓN ZONAMERICA

Become a Software Developer- For real

Our intensive program will first introduce you to the foundations of computer science and software engineering, then specialize in what drives you.

The first three sprints of our program covers the foundations of computer science and software engineering, including Linux, data structures, algorithms, low-level programming languages, high-level modern languages, databases, APIs, and DevOps.

Then, the last sprint you choose the specialization that is right for you:

- Back-end Web Development
- Front-end Web Development

What to Expect

1) No pre-course

Holberton does not expect students to come in with previous software engineering experience (although if you do have experience, that's awesome too).

There is no **pre-course work** (that's why you are attending a school after all), but we do recommend that you read through The C Programming Language book by Kernighan and Ritchie or Programming in C by Stephen Kochan.

The goal of reading through the book is not to deeply understand all the concepts, but to familiarize yourself with key terminology and content.

2) Coursework

We are training you to be a full-stack software developer in 12 months. The program will be intense.

There are no formal teachers or formal lectures. Students are learning by creating and we rely on peer-learning, collaboration, and industry-relevant curriculum to guide the way.

There is no competition here at Holberton, rather students are helping each other towards their goals. Of course, there is also technical staff available to answer questions and extend support.

3) Professional development

We know that the skills to get a job are different from the skills to be good at a job. From week zero, we immerse students in professional growth and development via workshops, projects, meetups, and work simulations.

Whiteboarding, mock interviews, professional networking, and more begin as soon as students start the program so that they're confident and competent when the time comes to prove they're ready for the job.

4) Soft Skills

In today's tech world, it's not enough to be good at technical skills, you need to be a clear communicator as well.

We push our students to work on their public speaking skills, to publish blog posts to online tech communities and publications, and to speak at conferences and meetups.

This not only prepares students to be team players and clear communicators, but creates amazing networking opportunities.

5) Included in All Holberton Sprints

Technical writing

Technical writing is an invaluable skill and an excellent way to articulate and share your knowledge.

Collaboration

Collaboration is key to successful business. You will learn project management, interpersonal communication, and team collaboration skills.

The Framework

The Framework provides the structure, order, and balance necessary to maintain a productive peer learning environment and will help you succeed throughout your career.

Whitheboarding

Whiteboarding is an essential skill in the tech industry, both for effective planning and for excelling in tech interviews.

Mock Interviews

It is not enough for you to know the answers to the questions; you need to be able to clearly communicate your thought processes and understanding.

What You"ll Learn

Foundation of Software and Development

This foundational knowledge of how computers and programming languages work will allow you to optimize and debug anything later on in your professional career. You will also begin working with algorithms and data structures which are essential foundations for great Software Engineers - the type that the best companies hire.

In the first sprint of foundations, you'll work in C and Unix programming, graphical programming, data structures, assembly language, and algorithms as well as reverse engineering and security protocols.

From there, you are introduced to higher-level languages, increasingly advanced algorithms, space and time complexity, database management, and front-end programming. Using the latest technologies, you will begin to create a complete web application project that will span the rest of the foundation sprints.

The final sprint of foundations emphasizes automation, scalability, and reliability, so that you are familiar with the infrastructure and best practices similar to those in tech powerhouses. Alongside a continuation in web development, you'll also advance in algorithmic understanding, technical writing, debugging, and project management.

Examples of Projects

- Write your own printf function
- Web stack debugging
- Build a video game
- Clone a marketplace
- Code your own shell

Curriculum
Foundation of Computer Science & Software Development

1st Sprint

01

- Git and command line editors
- Introduction to Bash
- C - first statements
- C - pointers
- C - recursion
- C - static library
- C - memory allocation
- C - preprocessor
- C - variadic functions
- C - bit manipulation
- C - file I/O
- Singly linked lists
- Create your own printf
- Create your own basic Shell

2nd Sprint

02

- Python - first statements
- Python - import and modules
- Python - data structures
- Python - exceptions
- Python - classes
- Python - inheritance
- Python - file I/O
- Python - JSON serialization/deserialization
- HTML/CSS introduction
- SQL - basic queries
- SQL - join queries
- C - dynamic libraries
- C - makefiles
- Doubly linked lists
- Stack and Queues
- Hash tables
- Sorting algorithms
- Binary trees
- Bash - scripting
- Unix processes and signals
- Regex
- Network introduction

3rd Sprint

03

- Python - Object-relational mapping
- Python - Web framework
- Python - RESTful API
- Python - web scraping
- Javascript - first statements
- Javascript - objects
- Javascript - scopes and closures
- Javascript - web scraping
- Search algorithms
- SSH
- SSL certificate
- Web server
- Load balancer
- Firewall
- MySQL primary-replica
- Server monitoring
- Code deployment
- Postmortem
- Webstak debugging
- Portfolio project

Specialization

12 MONTH PROGRAM

Back-end Web Development

Breathe life into the Web

Back-end web development is where the magic happens on websites. Finding the perfect rental, sharing a photo from the cloud, and keeping people secure while using the web are all driven by back-end web developers.

If you like building frameworks, working on complex projects, and the idea of making solutions that can help millions of people, Back-End Web Development might be for you.

The first three sprints of our on-site intensive education covers the foundations of computer science and software development. Students will explore and learn practical low-level programming, high-level programming, algorithms, databases, system engineering, and networking technologies.

For the last sprint, students will then focus on key back-end concepts and technologies. This includes languages like Python and Javascript, and concepts like API pagination, caching algorithms, testing, authentication mechanisms, and background jobs.

Students will learn how to architect and develop for platforms that are secure, optimized, stable and scalable.

Examples of Projects

- MySQL performance debugging
- Cache from scratch
- Authentication service
- Background jobs system
- Yellow pages in GraphQL
- Thumbnails on-demand

Curriculum
Back-end Web Development

Foundation

4th Sprint

04

- ES6 introduction / promise
- ES6 classes / data manipulation
- TypeScript
- Python
- async
- MySQL advanced
- NoSQL introduction
- Redis introduction
- API Pagination
- Caching algorithms
- Unit tests and integration tests
- i18n
- Personal data
- User
- authentications
- Node JS introduction
- Queuing system
- GraphQL API
- Async file API

Graduate

Front-end Web Development

Make Amazing Web Experiences

Front-end web development defines how we use our computers every day. The work of front-end developers is what helps technology be usable to the average person, and companies with the best, most stable, and most usable sites are the most popular on the web.

If you want to make the web more usable, more accessible, and more fun to use, Front-End Web Development is the path for you.

The first three sprints of our on-site intensive education covers the foundations of computer science and software development. Students will explore and learn practical low-level programming, high-level programming, algorithms, databases, system engineering, and networking technologies.

The final sprint of the curriculum will build upon this knowledge and focus on the skills that make successful front-end web developers. Students will study and master technologies like HTML, CSS, JavaScript, and developer tools and apply these technologies with React, one of the most popular front-end frameworks.

For Holberton, a front-end developer is not only someone who can code with a framework, but someone that understands why these frameworks exist, work and how they interact with the browser (like Chrome, Edge, Safari, etc.)

Examples of Projects

- Desktop and mobile version of a product website
- Student dashboard in React
- Countries portal with React and GraphQL
- CRM dashboard in React

Curriculum
Front-end Web Development

Foundation

04

4th Sprint

- ES6 introduction / promise
- ES6 classes / data manipulation
- TypeScript
- HTML / CSS advanced
- Developer tools
- Responsive design
- Webpack
- React introduction / props
- React component
- React inline-styling
- React state / immutable
- React Redux - action creator/normalizr
- React Redux - reducer/selector
- React Redux - connector/provider

Graduate

The application process

Our selection process is based only on talent and motivation. We don't care what degrees you may or may not have, if you have any previous programming experience, or your ability to pay. If you possess curiosity, determination, and drive to succeed, then we want you as a Holberton student.

Our automated admissions process aims to remove human biases. It was created specifically to identify smart, motivated people and doesn't take into account previous education, work experience, gender, ethnicity, or age. There's also no cost to apply. — the only requirements are you must be 18 years old and have a GED or high school diploma.

Here's how it works:

- Fill out a short online form about yourself (about 2 minutes)
- Complete small online projects and tests that you can do at your own pace (about 2 hours)
- You'll create your first website, from configuring a server to writing HTML, CSS and JavaScript (about 2 weeks)
- Complete an onsite or remote Q&A and tech challenge

Start Today With $0 Upfront

At Holberton, we believe that people from every community and background should have the opportunity to become a software engineer. That is why we offer an Income Share Agreement option to help make your new career more accessible.

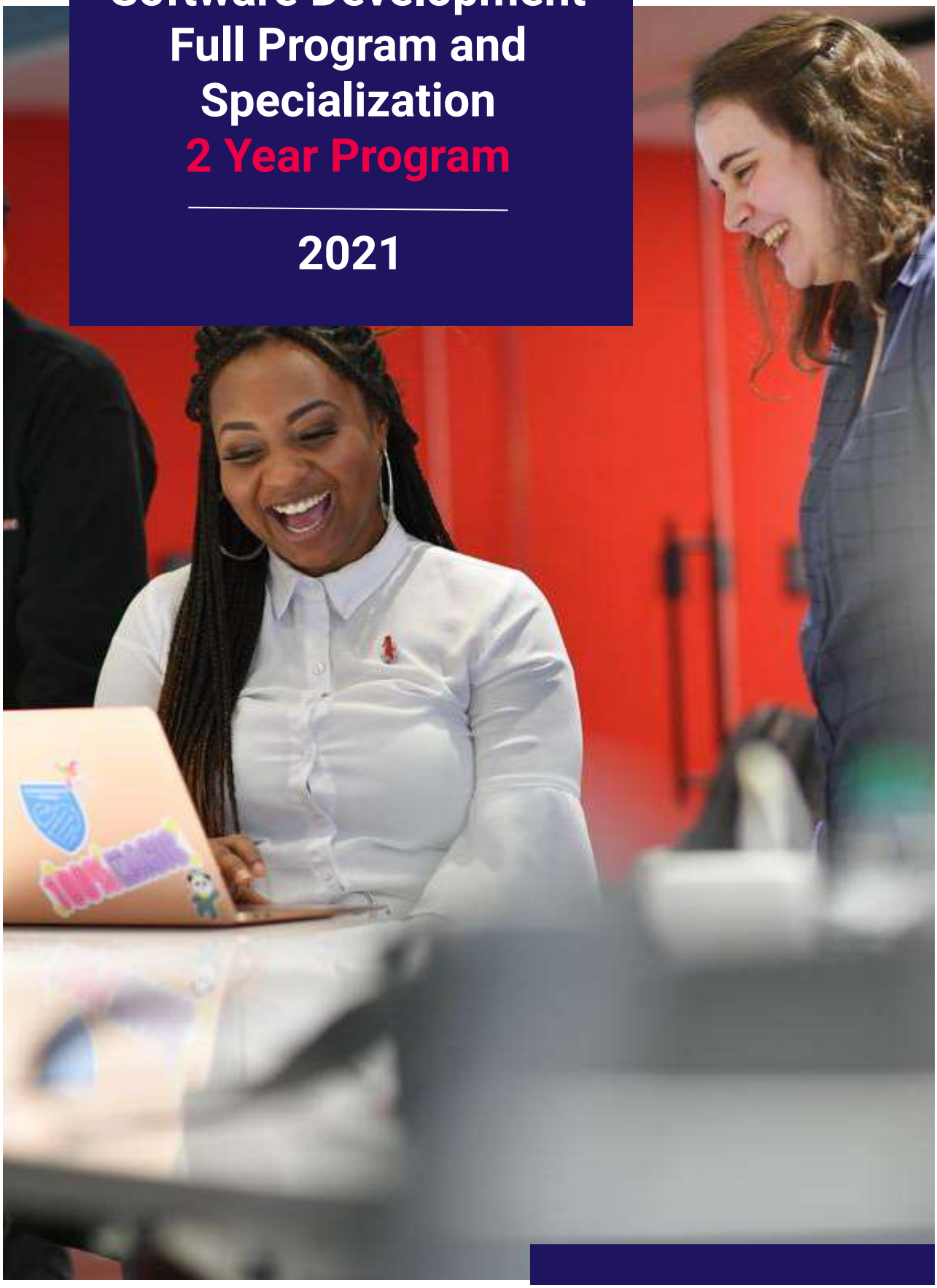
Contact us

Connect with your local campus. Check out our **Locations** page to find contact information and explore events, workshops, and networking opportunities in your city.

Software Development Full Program and Specialization

2 Year Program

2021



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- Machine Learning
- Augmented Reality & Virtual Reality
- Full-Stack Web Development
- Low Level & Algorithms

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- Web stack debugging
- Build a video game
- Clone a marketplace
- Code your own shell

Curriculum
Foundation of Computer Science & Software Development

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2nd Sprint

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3rd Sprint

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- Javascript - objects
- Javascript - scopes and closures
- Javascript - web scraping
- Search algorithms
- SSH
- SSL certificate
- Web server
- Load balancer
- Firewall
- MySQL primary-replica
- Server monitoring
- Code deployment
- Postmortem
- Webstak debugging
- Portfolio project

Specialization

2 YEAR PROGRAM

Full-stack Web Development

Become a Web Development Master

Streaming sites. Online stores. Government services. Our own website. All of these are powered by a combination of front-end and back-end web technologies. With our Full-Stack Web Development specialization, you will get an in depth education of the most popular web technologies and practical experience with developing useful web products.
The Full-Stack Web Development program is ideal for people who want to understand the whole picture of web development.
The first three sprints of our on-site intensive education covers the foundations of computer science and software development, including Linux, data structures, algorithms, low-level programming languages, high-level modern languages, databases, APIs, and DevOps
For the next three sprints, you will build upon this foundation by focusing on the most popular languages and technologies for web development, including Javascript, Python, React, Redis, MySQL, Node.js, SASS, and more. You will also learn best practices like user authentication, background jobs, and responsive design. Whether it's front-end, back-end, or full-stack development, this curriculum prepares you to create, maintain, and improve web applications and websites.
Typical job titles include: Full-stack web developer, Front-end developer, and Back-end developer.

Examples of Projects

- Desktop and mobile version of websites
- MySQL performance debugging
- Cache from scratch
- Authentication service
- Background jobs system
- Student dashboard in React
- CRM dashboard in React

Curriculum
Full-stack Web Development

Sprints 1 to 3

Foundations of Computer Science & Software Development

4th Sprint

04

- HTML/CSS advanced
- Developer tools
- SASS
- Flexbox and responsive design
- Form and Accessibility
- Bootstrap
- Javascript/JQuery advanced
- Cookies & local storage
- UI/UX research and development
- Build static web pages from a designer file
- Build a dynamic web application JavaScript

5th Sprint

05

- Advanced Python 3
- Personal data
- Authentication - basic and sessions
- User authentication service
- API Pagination
- Caching algorithms
- i18n
- Unit and integration tests
- MySQL advanced
- NoSQL introduction
- Redis introduction
- ES6 introduction / promise
- ES6 classes / data manipulation
- Node JS introduction
- Queuing system

6th Sprint

06

- TypeScript
- Webpack
- React introduction / props
- React component
- React inline-styling
- React state / immutable
- React Redux - action creator/normalizr
- React Redux - reducer/selector
- React Redux - connector/provider
- Implementation from a Designer file
- Learning project of your choice

Graduate

2 YEAR PROGRAM

Augmented Reality & Virtual Reality

Create New Worlds

Augmented Reality and Virtual Reality (AR/VR) is more than the latest gaming technology. WIth AR/VR, students in California can tour the pyramids of Egypt, doctors can practice lifesaving procedures, or you can even virtually test out furniture in your own living room. AR/VR will drive new ways for all of us to experience and share the world, and you will be ready to be a part of this wave. If you love art, education, games, or storytelling, our Augmented Reality & Virtual Reality program might be the right fit for you.

The AR/VR program builds upon the first three sprints with a new language, C#, and with a focus on Unity3D, the world's most popular AR/VR engine. The AR/VR program has also been developed in partnership with Unity, the developers of the Unity3D engine, to help you get a career-ready education.

You will create a 3D game from start to finish to learn how to script interactive behavior, handle asset management, utilize textures and materials, design user interfaces (UI), create animations, utilize audio sources, and publish applications for a variety of platforms and devices.

Building on your proficiency in Unity development, you will then create, design, and program interactive experiences in AR with ARKit, ARCore, and Vuforia SDKs, and in VR with Oculus SDK, OpenVR, and Google VR SDKs.

Typical job titles include: AR/VR Developer, AR/VR Research Engineer, AR/VR Content Developer, Interaction Designer, UX Designer

Examples of Projects

- Build a VR game
- 360 video
- Seated/standing VR experience
- Room scale experience
- Marker-based recognition
- An AR or VR experience of your own design

Curriculum
Augmented Reality & Virtual Reality

Foundations of Computer Science & Software Development

4th Sprint

04

- Fundamentals of programming in C#
- Introduction to Unity's interface and concepts
- Creating a basic maze game
- Creating a platformer game with models, textures, animation, audio, and UI
- Publishing and deploying cross-platform builds
- Basic linear algebra
- Test-driven development

5th Sprint

05

- Augmented reality
  - Image detection
  - Plane detection
- Virtual reality
  - 360 video
  - Room scale
- UI / UX concepts
  - interaction design
  - User comfort
  - Accessibility

6th Sprint

06

- ShaderGraph and shader programming
- Portfolio project pitch and development (3D, AR, or VR project of the your choosing, solo or with a group)

Graduate

2 YEAR PROGRAM

Machine Learning

Lead The Next Tech Revolution

Machine Learning is the technology behind the most exciting innovations today. Self driving cars, voice-controlled personal assistance, AI to help doctors diagnose diseases: All of these were developed with the help of Machine Learning software developers.

If you enjoy math, and have an eye for mixing intuition with problem solving, our Machine Learning curriculum might be the path for you.

During this specialization, you will be introduced and exposed to the core technologies and theories in the fields of computer vision, natural language processing, recommender systems, autonomous driving, and more.

You will also learn how to apply these concepts using technologies such as Pandas, Numpy, Tensorflow, and Keras. Throughout their study, you will dive deep into supervised, unsupervised and reinforcement learning, as well as the related mathematical principles.

Examples of Projects

- Object Detection
- Facial Recognition
- Q&A Chatbot
- Stock Predictions

Curriculum
Machine Learning

Sprints 1 to 3

Foundations of
Computer Science
&
Software Developments

4th Sprint

04

Mathematics
- Linear Algebra
- Calculus
- Probability

Supervised Learning
- Classification
- Regularization
- Optimization
- Error Analysis
- Convolutional Neural Networks
- Deep Convolutional
- Architectures
- Transfer Learning
- Object Detection
- Face Verification
- Neural Style Transfer

5th Sprint

05

Mathematics
- Advanced Probability
- Advanced Linear Algebra

Supervised Learning
- Recurrent Neural Networks
- Deep Recurrent Architectures
- Natural Language Processing
- Time Series Analysis

Unsupervised Learning
- Dimensionality Reduction
- Clustering
- Hidden Markov Models
- Neural Style Transfer

6th Sprint

06

Reinforcement Learning
- Multi-armed bandit
- Epsilon Greedy
- Deep Reinforcement Learning

The Pipeline
- Bias Avoidance
- Pandas
- RESTful APIs
- MapReduce
- SQL and NoSQL Databases
- Google Cloud Platform
- Hadoop

Portfolio Project
Pitch and develop a Machine

GRADUATE

2 YEAR PROGRAM

Low Level & Algorithms

Cutting edge development

Throughout this program, you will extend your knowledge of the C programming language, dig deeper into the Linux operating system.
You will also be challenged with advanced data structures and algorithms, and you will uncover all the mechanisms behind the blockchain technology by building your own basic cryptocurrency, from scratch.

Holberton's System Programming and Blockchain program will equip you to be well-versed in C, Linux kernel (signal, thread, file stream, IPC, ELF, etc.), advanced trees, graph, pathfinding, cryptography, block mining, blockchain, and more.

This specialization builds a solid foundation for students who aim to become capable, well rounded Software Developers who are as comfortable programming a blockchain as they are developing on embedded systems and self-driving cars.

Typical job titles could include: Software engineer, embedded system programmer, SRE, Junior Blockchain Developer.

The last sprint is dedicated to building a personal web project on the technology of a student's choice.

Examples of Projects

- Create your own advanced Shell and ls program
- Create your own Malloc
- Build your own web server in C
- Advanced algorithm design
- Blockchain implementation in C

Curriculum
System Programming & Blockchain

Sprints 1 to 3

Foundations of Computer Science & Software Development

4th Sprint

04

- Unix file management
- Static variables
- User inputs
- Create your own advanced Shell
- /proc filesystem
- ELF - readelf
- x86 Assembly
- Signals
- Red-Black trees

5th Sprint

05

- ELF - nm/objdump
- CPython
- Strace
- Multithreading
- Advanced memory allocation
- Graphs
- Huffman coding

6th Sprint

06

- Sockets
- N-ary trees
- Blockchain - Crypto
- Blockchain - Data structures
- Blockchain - Block mining
- Blockchain - Transactions
- Blockchain - CLI
- Learning project of your choice

Graduate

2 YEAR PROGRAM

The application process

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Learn more

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