Foundations of Computer Science and Machine Learning

18-month Program

Holberton
PERU

Become a Software Engineer - 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 3 sprints will be dedicated to Machine Learning.

What to Expect

1) No pre-course

Holberton School 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 engineers in 9 months, and an Machine Learning Specialist in 18 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 School, 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 School Sprints

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

Collaboration: It's key to successful business. You will learn project management, interpersonal communication, and team collaboration skills.

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

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

Mock Interviews: it is not enough fo you to know the answers to the questions; you need to be able to clearly communicate your thought processes and understanding

English Lessons: Optional for students, English lessons will be provided. Improving this aspect is essential for students, because it will allow them to apply to many more remote job positions.

Coaching and Professional Development Program: Students will be provided with individual Coaching sessions and group workshops, once a week, in order to improve their ability to land and maintain a job

What You'll Learn

Foundations of Computer Science

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 foundations 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
- Clone a marketplace
- Code your own shell

Curriculum
Foundations of Computer Science & Software Engineering

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

18-MONTH 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 engineers.

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 Engineering

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

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 School 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 if you want to apply for the Income Share Agreement.

Start your application today: **https://apply.holbertonschool.com/**

Flexible Tuition Options

We don’t think that financial capacity should be a barrier. That's why at Holberton School, we offer flexible tuition options that allow you to focus on school, not tuition.

Contact us

You can find more information through our website www.holbertonperu.com

Or contact us at per-admissions@holbertonschool.com or through WhatsApp to the number +51 923 898 366.