# Fintech Boot Camp Syllabus

Welcome to the Fintech boot camp!

## Course Overview

The 24-week Fintech boot camp is a challenging, part-time program that focuses on the practical technical skills needed to use data analytics, machine learning, and blockchain technologies in the Fintech industry. Throughout the course, you will gain proficiency in numerous marketable technologies and skills, including Python, Pandas, SQL, AWS, Ethereum, and more. Additionally, you'll build an impressive professional portfolio and the confidence to succeed in a high-growth profession.

There are no required prerequisites for this boot camp. However, you must have fundamental computer skills and feel comfortable using the internet.

### Course Outcomes

By the time you graduate, you'll be able to:

- Build communication skills and foundational knowledge to prepare for technical interviews.
- Demonstrate strong teamwork and project management skills as a collaborator and independent contributor during the development cycle of complex projects.
- Apply modern financial technologies in real-world settings, such as an investment bank, insurance agency, or any player in the financial industry.
- Employ financial and statistical analysis techniques to model, predict, and forecast trends and model financial portfolios.
- Make API requests to pull financial data, and use a variety of Python packages to run financial analysis on large datasets.
- Conduct time series analysis to develop financial forecasts, and analyze forecasts for accuracy.
- Work with databases on the AWS cloud in the service of financial applications.
- Use a variety of machine learning algorithms and understand their proper application within the field of finance.
- Design and implement smart contracts with the Solidity programming language.
- Build an Ethereum blockchain and understand how transactions are validated on a distributed ledger.

# Course Calendar

Each week is structured around a specific topic and set of skills. You'll also complete a Challenge assignment to apply the skills and knowledge you learned throughout the week.

Section 1: Financial Programming

- Week 1: Introduction to Fintech
    - Class 1: Welcome to Fintech
    - Class 2: Deep Dive Into Fintech
    - Class 3: Fintech Collaboration
    - Challenge: Fintech Case Study

- Week 2: Python
    - Class 1: The Emergence of Python
    - Class 2: Data Structures and Functions
    - Class 3: Functions and Files
    - Challenge: Automate Your Day Job with Python

- Week 3: Python and Pandas
    - Class 1: Python Review Day
    - Class 2: Meet Pandas
    - Class 3: Risk and Returns Over Time

- Week 4: Pandas
    - Class 1: Investing Like the Pros
    - Class 2: Pandas Review Day
    - Class 3: Whiteboard Interviews
    - Challenge: A Whale Off the Port(folio)

- Week 5: Financial Simulations and APIs
    - Class 1: APIs
    - Class 2: APIs in Fintech
    - Class 3: Predicting the Future with Monte Carlo Simulations
    - Challenge: Financial Planning

- Week 6: Data Visualization
    - Class 1: Making and Understanding Interactive Plots
    - Class 2: Customized Visualizations and Data Aggregation
    - Class 3: Plotting Geospatial Data
    - Challenge: Housing Rental Analysis

- Week 7: Financial Databases with SQL
    - Class 1: Introduction to SQL
    - Class 2: Advanced SQL Queries

    - Class 3: Data Modeling
    - Challenge: Looking for Suspicious Transactions

- Project 1

Section 2: Machine Learning Applications in Finance

- Week 10: Unsupervised Learning
    - Class 1: Supervised vs. Unsupervised Learning and Clustering
    - Class 2: Data Preprocessing and Normalization
    - Class 3: Principal Component Analysis
    - Challenge: Crypto Clustering

- Week 11: Time Series
    - Class 1: Working with Time Series Data
    - Class 2: Time Series Forecasting
    - Class 3: Time Series Forecasting with Prophet
    - Challenge: Forecasting Net Prophet

- Week 12: Supervised Learning
    - Class 1: Introduction to Supervised Learning
    - Class 2: Trees and Ensemble Learning
    - Class 3: Imbalanced Classes
    - Challenge: Credit Risk Classification

- Week 13: Neural Networks
    - Class 1: Introduction to Neural Networks
    - Class 2: Deep Neural Networks
    - Class 3: Advanced Topics in Neural Networks
    - Challenge: Venture Funding with Deep Learning

- Week 14: Algorithmic Trading
    - Class 1: Introduction to Algorithmic Trading
    - Class 2: Backtesting in Algorithmic Trading
    - Class 3: Algorithmic Trading with Machine Learning
    - Challenge: Machine Learning Trading Bot

- Week 15: Robo Advisors
    - Class 1: Introduction to AWS Machine Learning and Robo Advisors
    - Class 2: Power Up Chatbots with AWS Lambda
    - Class 3: Running Machine Learning Models in the Cloud
    - Challenge: Robo Advisor for Retirement Plans

- Project 2

Section 3: Blockchain and Cryptocurrency

- Week 18: Blockchain with Python
    - Class 1: Introduction to Blockchain
    - Class 2: Build a Shared Record-Keeping System
    - Class 3: Build a Decentralized Network
    - Challenge: PyChain Ledger

- Week 19: Blockchain Wallets
    - Class 1: Blockchain Transactions and Web3.py
    - Class 2: Digital Signatures and Keys
    - Class 3: Testing Blockchain Transactions
    - Challenge: Cryptocurrency Wallet

- Week 20: Smart Contracts with Solidity
    - Class 1: Fundamentals of Smart Contracts
    - Class 2: Interacting with Smart Contracts
    - Class 3: Deploying Smart Contracts and Adding Functionality to Them
    - Challenge: Joint Savings Account

- Week 21: Tokenomics
    - Class 1: Introduction to Tokens
    - Class 2: Token Standards
    - Class 3: Crowdsales
    - Challenge: Martian Token Crowdsale

- Week 22: Decentralized Applications
    - Class 1: Fundamentals of Decentralized Applications
    - Class 2: Optimizing Decentralized Applications
    - Class 3: Building Certificate Smart Contracts

- Project 3

# Course Structure

## Instructor-Led Classes

All virtual classes will be hosted on Zoom. You can access these sessions through your class calendar. During the classes, your instructional team will lead demonstrations, as well as guide you through independent activities and interactive group work. You will also use Slack to communicate and collaborate with your instructor and peers. Class recordings are available in Canvas (Bootcamp Spot (BCS)).

## Office Hours

Open office hours are held before and after every class. During office hours, your instructional team will be available to answer questions, offer technical support and troubleshooting, and review content.

## Getting Started with Tech

Review the prework for detailed information about hardware and software requirements for this boot camp.

# Your Support Community

We believe that a robust support team is essential to helping you succeed in the program. The core members of your support team are highlighted in this section.

## Instructor

Your instructor is the lead facilitator for your learning experience. They guide all classes and office hours, guide the TA team, and monitor your progress.

## Teaching Assistants (TAs)

The TAs provide support and guidance. They attend classes, help troubleshoot issues, answer questions, and lead small breakout groups. TAs also offer additional office-hour sessions on Zoom.

## Student Success Manager (SSM)

Your SSM oversees your experience and helps you with any non-curriculum needs. These include questions about the course structure, delivery, and policies. If you don’t know where to go, whom to ask, or what to do, ask your SSM!

## Peers

You'll collaborate with other students, seek their help, and assist others both in class and on Slack. You’ll also connect with peers in group projects and study groups.

## Career Services

Your Career Coach and Career Materials Advisor will support you in becoming employer-competitive. The career services team provides optional services throughout the program.

## Learning Assistants

Learning assistants are available to answer quick content and concept questions via Slack outside of class hours. Simply use the #AskBCS tool in Slack to connect.

## Tutor Network

If you need additional help to get back on track, you can request a tutor by using the “Student Support” link in Canvas (Bootcamp Spot).

# Assignments and Grading

## Assignments

Throughout the course, you will complete the following types of assignments:

- **Weekly Challenges:** Each week includes an individual, culminating assignment that requires you to apply key skills covered in that module. In general, the weekly Challenge should take 5–10 hours to complete. There are 16 weekly Challenges throughout the boot camp, with two being optional to complete for extra credit. In addition to the optional Challenges, you may skip two Challenges if you wish. In those cases, you will submit a statement that you’re skipping. If you complete all Challenges, your lowest two grades will be dropped when calculating your overall grade.

- **Projects:** Throughout the course you will complete three group projects. For these projects, teams will apply key processes learned during the associated section of the boot camp to build dynamic applications. You will receive detailed instructions for each assignment throughout the course.

## Grade Breakdown

You will receive an overall grade for the course based on the following:

- Projects: 30%
- Challenge Assignments: 70%
- Extra Credit Challenge Assignments: Additional 5% possible

## Grading Policy

For each assignment, you'll receive both a numeric and letter grade, as the following table shows:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **A+** | 100 | **B+** | 88–91 | **C+** | 78–81 | **D+** | 70–71 | **F** | <61 |
| **A** | 95–99 | **B** | 85–87 | **C** | 75–77 | **D** | 65–69 | | |
| **A–** | 92–94 | **B–** | 82–84 | **C–** | 72–74 | **D–** | 62–64 | | |

You'll receive an incomplete" for any assignment that doesn't meet the baseline requirements. If a Challenge submission is marked as "0," it is considered incomplete and will not count toward your graduation requirement. Examples of incomplete submissions include:

- A repository that has no code.
- A repository that includes a unique name but nothing else.
- A repository that includes just a sample README file but nothing else.

Each assignment that doesn't receive an "incomplete" will count toward the graduation requirements. For the minimum grading requirements, refer to your enrollment agreement.

## Graduation Requirements

Graduates of the course will receive a certificate of completion from the university. To graduate from this course and receive your certificate, you must fulfill the following requirements:

- Miss no more than 8 classes.
- Complete all projects.
- Miss no more than two Challenges.

# Procedures and Policies

## Accessibility and Privacy Policies

**The following links display the accessibility policies for the technologies used in this course:**

- Canvas Product Accessibility
- Slack Multi-year Accessibility Plan
- Zoom Accessibility

**The following links display the privacy policies for the technologies used in this course:**

- Canvas Product Privacy Policy
- Slack Privacy Policy
- Zoom Privacy Statement

## Career Services Policy

The career services team strives to help you become employer-competitive. They offer support via a career materials advisor, a career coach, in-person demo days, and online workshops and events. Once you have an employer-ready resume on file and have completed five weeks of the boot camp, you'll have access to one-on-one career coaching until 90 days after graduation. Your career materials advisor will respond within 96 business hours, and your career coach will respond within 24 business hours.

## Code of Conduct / Academic Honesty

You are expected to work independently on all individual graded assignments and to submit your own work. Any violations of the university's academic honesty policy may result in your removal from the program. Please consult with your student success manager (SSM) if you have any questions about the university's policy.

## Communication Guidelines

At times, a boot camp can be stressful; you're working to puzzle out emerging skills. It's important to be mindful of your peers' needs and to be courteous in how you communicate with them and your support teams. This is especially true in online communication spaces, such as email or Slack, where it's easy to misinterpret comments. Consider the following communication guidelines:

- Use encouraging, supportive tones when interacting with peers.
- Try to help peers who are stuck on a topic.
- Take opportunities to thank your support team for their help.

- Avoid yelling, sarcasm, and abusive language directed at peers or support-team members.
- Be clear and specific in all your help requests. Include screenshots and locations for content trouble spots so that your TAs and peers can efficiently help you.

## Course Feedback

We believe in continually improving our program—whether that means building in more targeted practice to support learning, adding new content to address the evolving needs of a dynamic industry, or providing your instructor with innovative ideas to tailor the classroom experience. For this reason, we ask for your feedback at the end of each module, at the midpoint of the course, and at the end of the course. We appreciate your honest responses.

## Drop Policy

If you're not able to take the course, you can drop it within the timeframe that your enrollment agreement outlines and receive a refund of your balance paid. After the first full week, you're required to fulfill your tuition payments regardless of your status in the course.
If you want to drop the course, you must contact your SSM.

## Late Assignments Policy

All weekly Challenges are due at the time indicated on the course calendar in your learning environment. It's important that you follow these dates to stay on target and receive timely feedback. The program moves fast, so you will find it difficult to catch up if you fall behind. You may skip two Challenges if you wish. You must submit all work by the last day of the course.

## Tutoring Policy

We offer tutoring for students who need additional support through 50-minute, one-on-one online sessions. While tuition is inclusive of this service, you must be in good standing with class attendance, payment, and assignment submissions to qualify for tutoring. Students are granted one session per week during the course. You cannot accrue additional sessions, nor can they be held after the graduation date.

Failure to show up for a scheduled tutoring session will result in ineligibility for future tutoring. If you need to cancel a tutoring session, you must do so at least six hours before the session is scheduled to begin.