LFS171x - Introduction to Hyperledger Blockchain Technologies

Course Overview

Discover the power of business blockchains and distributed ledger technologies with an overview of Hyperledger and its key frameworks. All over the global market there are ledgers that organizations and individuals alike must trust. Blockchain technologies record promises, trades, transactions or simply items we never want to disappear, allowing everyone in an ecosystem to keep a copy of the common system of record.

This introductory course is carefully curated for nontechnical, business-oriented audiences. It examines blockchains for the enterprise and a number of pertinent use cases from Hyperledger, a global cross-industry community of communities hosted by The Linux Foundation and advancing business blockchain technologies. Hyperledger is incubating and promoting enterprise grade, open source business blockchain software, on top of which anyone can set up apps to meet cross-industry needs.

The course covers key features of blockchain technologies and the differentiators between various types of Hyperledger projects. We'll start with "What is blockchain?" and open the discussion to identifying suitable blockchain use cases for your business requirements. We will then take a deeper dive into the enterprise-ready Hyperledger blockchain frameworks and tools.

Students will gain an understanding of how blockchains work and how they can create value for their business through cost-savings and efficiencies, in terms of speed and simplicity. They will view how information is generated, stored, and shared in various blockchains, as well as gain

tools to evaluate whether or not a blockchain solution would be suitable for their particular business case.

Industries today are using blockchain technologies to increase efficiency and solve business problems associated with data privacy, security, information sharing, and inclusion. Be on the cutting edge; learn about these innovative technologies and bring unique value to your business.

Course Instructors

Alexandra Groetsema is a content creator and author of the technical chapters of this course. As a blockchain developer with a background in biology, she has worked at various tech companies in the Bay Area. She is currently a blockchain developer and project manager at DLT.Education. Additionally, she attended Blockchain University as a Women in Tech Diversity scholar. She received her BA in Molecular and Cell Biology from UC Berkeley in 2014. Her areas of expertise include: blockchain technology, biology/healthcare and design.

Arianna Groetsema is a content creator and contributor for the technical and business chapters of this course. She has a background in web and mobile development and is currently transitioning into the crypto space. Arianna was one of the winners in Blockchain University's 2015 Hackathon. She is a Women in Tech Diversity scholar and collaborator with Blockchain University. Arianna is currently pursuing a Bachelors of Science in Computational Mathematics at UCLA. Her areas of expertise include: mathematics and blockchain technology.

Navroop Sahdev is an Economist by training, but she is currently building a FinTech subsidiary that seeks to leverage blockchain technology. She is a Research Associate at the Center for Blockchain Technologies at University College London and the Centre d'économie de l'Université Paris Nord (CEPN) and holds three masters in IP Management, Economics of Innovation and Applied Economics respectively. In the past, she has worked at Harvard University, UN Environment Programme and University of the Fraser Valley. Her research interests are focused on Blockchain/Distributed Ledger Technologies, Game Theory, Networks Theory and Complex Systems Science.

Nathalie Salami is a licensed California attorney working with blockchain regulatory and compliance issues. Nathalie is dedicated to the advancement of the blockchain industry. She received her B.A. from UC Berkeley in 2004 and J.D. from UCLA in 2009. Currently, Nathalie works as an attorney at Fintech Portfolio. Fintech Portfolio allows entrepreneurs to raise capital online in a compliant manner. Her areas of expertise include: crowdfunding laws, blockchain regulations, Bank Secrecy Act, anti-money laundering (AML/KYC) laws and Health Information Privacy Rules (HIPAA HITECH Compliance).

Robert Schwentker is the DLT.Education President, and Founding President of Blockchain University. He specializes in high tech education focused on blockchain and distributed ledger technologies. With over 25 years in fintech education and innovation, he has delivered courses, lectures, hackathons and projects throughout the US, Canada, Brazil, Belgium, Spain, Italy, Turkey, Saudi Arabia, India, Singapore and Japan. Previously, he led developer and startup programs at PayPal and American Express. Robert holds 30+ IBM Certifications as Developer,

Administrator and Instructor. His areas of expertise include: fintech, education and blockchain technology.

Alejandro (Sasha) Vicente Grabovetsky is CTO and Chief Data Scientist at AID:Tech. Sasha uses his technical and analytical skills to develop Blockchain solutions that can be easily deployed on the cloud using Kubernetes and Helm. Originally, Sasha used to be a Cognitive Neuroscientist at Cambridge, and has won international awards for science and technology communication.

Nicola Paoli is Lead Blockchain Developer at AID:Tech. With experience in enterprise software development, education and open-data visualisation, he is now focusing on developing business blockchain solutions using Hyperledger. Nicola has submitted multiple improvements to the Hyperledger Composer codebase, notably a feature enabling the use of an API-key to access the REST server.

Stephen Curran is a veteran in Software Development and DevOps who dove full on into the Hyperledger Indy world in 2017. Working with the British Columbia (BC) Government, Stephen has helped define, build and launch the Verifiable Organizations Network (VON) - a production instance of Hyperledger Indy that makes public information about Organizations (Incorporations, etc.) in BC available in the form of Verifiable Credentials. Stephen is a regular presenter in the Hyperledger Indy community, facilitating discussions and driving interoperability. Stephen has presented on Blockchain and the Hyperledger Indy project at a number of events. Stephen is a member of the Sovrin Foundation Technical Governance Board.

Flavia Cioanca is an Instructional Design Manager at The Linux Foundation. In her role, she leads elearning projects on open source technologies advanced by the Foundation and its collaborative projects, designing engaging, hands-on learning experiences that cater to a wide variety of audiences. She has extensive expertise in training, online course development, and learning management systems. She received a Master of Arts in Human Resource Development from Northeastern Illinois University.

Audience

LFS171x - Blockchain for Business: An Introduction to Hyperledger Technologies is designed for nontechnical, business-oriented audiences eager to learn about key features of Hyperledger blockchain technologies and their use cases.

Prerequisites

You should have a basic understanding of technology and computer terminology, networking, databases.

Course Length

10-20 hours

Course Learning Objectives

By the end of this course, you should be able to:

- Describe Business Blockchain and Distributed Ledger Technologies.
- Gain familiarity with current Hyperledger projects and cross-industry use cases.
- Become involved in and contribute to the open source Hyperledger projects.

Course Outline

Welcome!

Chapter 1. Discovering Blockchain Technologies

- Introduction and Learning Objectives
- Distributed Ledger Technology (DLT)
- Bitcoin and Ethereum Blockchains
- Exploring Permissionless Blockchains
- Consensus Algorithms
- Hyperledger
- Other Open Source Permissioned Distributed Ledgers
- Challenges in the Adoption/Deployment of Distributed Ledger Technologies
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Conclusions

Chapter 2. Introduction to Hyperledger

- Introduction and Learning Objectives
- Hyperledger
- Q/A with Brian Behlendorf, Executive Director of Hyperledger
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Conclusions

Chapter 3. Hyperledger Frameworks

- Introduction and Learning Objectives
- Hyperledger Frameworks
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Conclusions

Chapter 4. Hyperledger Tools

- Introduction and Learning Objectives
- Hyperledger Tools
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Conclusions

Chapter 5. The Promise of Business Blockchain Technologies

- Introduction and Learning Objectives

- Existing Blockchain Use Cases
- When to Use or Not to Use Blockchain Technologies
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Conclusions

Chapter 6. What's Next?

- What's Next?

Final Exam (Verified Certificate track only)

edX Platform

If you are using edX for the first time, we strongly encourage you to start by taking a free 'how to use edX' course that the team at edX has made available. In this course, you will learn how to navigate the edX platform, how to connect with other edX learners, how to answer problems on the edX platform, how grades work in edX courses, and how to complete your first course.

Click here to register for "*DemoX*" and you will be on your way. You will find the edX platform simple and intuitive.

Getting Help

For any **technical issues** with the edX platform (including login problems and issues with the Verified Certificate), please use the **Help** icon located on the upper right side of your screen.

One great way to interact with peers taking this course and resolving any **content-related issues** is via the **Discussion Forums**. These forums can be used in the following ways:

- To discuss concepts, tools, and technologies presented in this course, or related to the topics discussed in the course material.
- To ask questions about course content.
- To share resources and ideas related to Hyperledger technologies.

We strongly encourage you not only to ask questions, but to share with your peers opinions about the course content, as well as valuable related resources. The Discussion Forums will be reviewed periodically by The Linux Foundation staff, but it is primarily a community resource, not an 'ask the instructor' service.

To learn more tips on how to use them, read the following article: "*Getting the Most Out of the edX Discussion Forums*".

Course Timing

This course is entirely self-paced; there is no fixed schedule for going through the material. You can go through the course at your own pace, and you will always be returned to exactly where you left off when you come back to start a new session. However, we still suggest you avoid long breaks in between periods of work, as learning will be faster and content retention improved.

The chapters in the course have been designed to build on one another. It is probably best to work through them in sequence; if you skip or only skim some chapters quickly, you may find there are topics being discussed you have not been exposed to yet. But this is all self-paced and you can always go back, so you can thread your own path through the material.

Learning Aids

Besides simple exposition through text and figures, this course uses several additional methods to present and solidify the learning material, including videos, scenarios, external resources, glossary and knowledge check questions (Verified Certificate track only).

Audit and Verified Tracks

You can enroll into an audit or a verified track. In an audit track, you will have access to all ungraded course content: course readings, videos, and learning aids, but no certificates are awarded when auditing. You will not be able to access any graded content (knowledge check questions at the end of each chapter, and the final exam).

In order to receive a certificate, you will need to obtain a passing grade (please refer to the "Grading" section below), verify your identity with edX, and pay a fee. Once all edX requirements have been met, you can download your certificate from the Progress tab.

To learn more about audit and verified tracks, visit edX Help Center > Certificates.

Grading (Verified Certificate track only)

At the end of each chapter, you will have a set of graded **knowledge check questions**, that are meant to further check your understanding of the material presented. The grades obtained by answering these knowledge check questions will represent **20%** of your final grade.

The remaining **80%** of your final grade is represented by the score obtained in the **final exam**. The final exam is located at the end of the course and it consists of 15 questions.

You will have a maximum of two attempts to answer each knowledge check and final exam question (other than True/False questions, in which case, you have only one attempt). You are

free to reference your notes, screens from the course, etc., and there is no time limit on how long you can spend on a question. You can always skip a question and come back to it later.

In order to complete this course with a passing grade, you must obtain a passing score (knowledge check and final exam) of minimum 70%.

Course Progress and Completion (Verified Certificate track only)

Once you complete the course (including knowledge check questions and final exam), you will want to know if you have passed. You will be able to see your completion status using the **Progress** tab at the top of your screen, which will clearly indicate whether or not you have achieved a passing score.

Professional Certificate Program

Professional Certificate programs are a series of courses designed by industry leaders and top universities to build and enhance critical professional skills needed to succeed in today's most in-demand fields.

LFS170x - Blockchain: Understanding Its Uses and Implications and *LFS171x - Introduction to Hyperledger Blockchain Technologies* are part of the **Blockchain for Business Professional Certificate**. In order to earn the Blockchain for Business Professional Certificate, you have to be enrolled in the program and obtain **verified certificates from the two above-mentioned courses**.

To learn more about our Professional Certificate, click here.

Hyperledger

Hyperledger is the umbrella open source project that The Linux Foundation has created and hosted since 2015. It aims at advancing and promoting cross-industry blockchain technologies to ensure accountability, transparency, and trust among business partners. As a result, Hyperledger makes business network and transactions more efficient.

These benefits are valued by leaders across many industries, including technology, finance, healthcare, supply chain, and automotive, among several others.

To learn more about the Hyperledger, click here.

About The Linux Foundation

The Linux Foundation is a non-profit organization founded in 2000 and is the home of Linux creator Linus Torvalds. Ever since then, it has provided a neutral environment where Linux

kernel development could be protected and accelerated.

Linux's success catalyzed the growth of the open source community, and demonstrated the commercial efficacy of open source. It inspired countless new projects across all industries and levels of the world's technology infrastructure.

Today, the Linux Foundation's work extends far beyond Linux, fostering innovation at every technology layer.

We partner with the world's leading developers and companies to solve the most challenging technology problems and accelerate open technology development and commercial adoption. Our mission is to provide experience and expertise to any initiative working to solve complex problems through open source collaboration, supplying the tools to scale open source projects. This includes bolstering security, best practices, governance, operations and ecosystem development and training such as this course.

By doing so, the Linux Foundation has become the umbrella organization for many critical open source projects that power corporations across all industry sectors.

- Big data and analytics (ODPi, R Consortium)
- Networking (OpenDaylight, ONAP, OPNFV)
- Embedded (Dronecode, Zephyr)
- Web tools (JS Foundation, Node.js)
- Cloud computing (Cloud Foundry, Cloud Native Computing Foundation, Open Container Initiative)
- Automotive (Automotive Grade Linux)
- Security (The Core Infrastructure Initiative)
- Blockchain (Hyperledger)
- And many more.

To learn more about The Linux Foundation, click here.

The Linux Foundation Events

The Linux Foundation hosts an increasing number of events each year, including:

- Open Source Summit North America, Europe, Japan and China
- Embedded Linux Conference + OpenIoT Summit North America and Europe
- Open Source Leadership Summit
- Open Networking Summit North America and Europe
- KubeCon + CloudNativeCon North America, Europe and China
- Automotive Linux Summit
- KVM Forum
- Linux Storage Filesystem and Memory Management Summit
- Linux Security Summit North America and Europe

- Cloud Foundry Summit
- Hyperledger Global Forum
- And many more.

To learn more about The Linux Foundation events and to register, click here.

The Linux Foundation Training

The Linux Foundation offers several types of training:

- Classroom
- Online
- On-site
- Events-based.

To get more information about specific courses offered by The Linux Foundation, click here.

The Linux Foundation Certifications

The Linux Foundation certifications give you a way to differentiate yourself in a job market that's hungry for your skills. We've taken a new, innovative approach to open source certification that allows you to showcase your skills in a way that other peers will respect and employers will trust:

- You can take your certification from any computer, anywhere, at any time
- The certification exams are performance-based
- The exams are distribution-flexible
- The exams are up-to-date, testing knowledge and skills that actually matter in today's IT environment.

The Linux Foundation and its collaborative projects currently offer the following certifications:

- Linux Foundation Certified System Administrator (LFCS)
- Linux Foundation Certified Engineer (LFCE)
- Certified Kubernetes Administrator (CKA)
- Certified Kubernetes Application Developer (CKAD)
- Cloud Foundry Certified Developer (CFCD)
- Certified Hyperledger Fabric Administrator (CHFA)
- Certified Hyperledger Sawtooth Administrator (CHSA).

Open Source Guides for the Enterprise

The Linux Foundation in partnership with the TODO Group developed a set of guides leveraging best practices for:

- Running an open source program office, or
- Managing an open source project in your organization.

To learn more, you can visit the following webpage: "*Open Source Guides for the Enterprise*".

Copyright