IIT KANPUR
Indian Institute of Technology Kanpur

simplilearn

PROFESSIONAL CERTIFICATE PROGRAM IN

BLOCKCHAIN

Table of Contents

About the Program

Fast-track your career in the emerging blockchain area with this acclaimed Blockchain Certification Program, in partnership with IIT Kanpur. This program features the perfect mix of theory, case studies, and extensive hands-on practicum. Learners will receive a comprehensive blockchain education while leveraging IIT Kanpur's academic excellence and expertise in this growing field.

This Blockchain Certification Program is designed for both graduates and experienced professionals in multiple industries. A comprehensive blockchain education through a blend of online self-paced videos, live virtual classes, hands-on projects, and labs. Learners will also get access to mentorship sessions that provide a high-engagement learning experience and real-world applications to help master essential blockchain skills. This blockchain certification program covers concepts of Bitcoin, Hyperledger, Ethereum, Ripple and Multichain blockchain platforms. In this blockchain course, learn about private blockchain networks, smart contracts, applications and architecture using Ethereum.

Key Features of the Professional Blockchain Certification Program By IIT Kanpur

Blockchain Certification by IIT Kanpur

4+ hands-on projects in integrated labs

70+ hours of applied learning

Masterclasses from IIT Kanpur faculty

Industry Oriented Capstone Projects

Simplilearn Job Assistance with Hirist (India Only)

About the Professional Blockchain Certification Program By IIT Kanpur

IIT Kanpur is among the most prestigious and oldest educational institutes in India that offers various undergraduate, postgraduate, and integrated research programs in the field of engineering, science, management and design.

This Blockchain certification program covers concepts of Bitcoin, Hyperledger, Ethereum, and Multichain blockchain platforms. In this blockchain course, learn about private blockchain networks, smart contracts, applications and architecture using Ethereum. . Upon completion of this professional Blockchain Certification program, you will have a functional understanding of the latest relevant skills on blockchain.

About Simplilearn

Simplilearn is the world's #1 online bootcamp provider that enables learners through rigorous and highly specialized training. We focus on emerging technologies and processes that are transforming the digital world, at a fraction of the cost and time as traditional approaches. Over one million professionals and 2000 corporate training organizations have harnessed our award-winning programs to achieve their career and business goals.

Program Eligibility Criteria and Application Process

Those wishing to enroll in this Blockchain Certification program by IIT Kanpur will be required to apply for admission.

Eligibility Criteria

For admission to this Blockchain certification program candidate must have basic mathematical skills:

- ✔ 2+ years of work experience (preferred)
- ✔ Basic understanding of programming (preferred)

Application Process

The application process consists of three simple steps. An offer of admission will be made to the selected candidates and accepted by the candidates by paying the admission fee.

STEP 1 SUBMIT AN APPLICATION	STEP 2 APPLICATION REVIEW	STEP 3 ADMISSION
Complete the application and include a brief statement of purpose. The latter informs our admissions counselors why you're interested and qualified for the program.	A panel of admissions counselors will review your application and statement of purpose to determine whether you qualify for acceptance.	An offer of admission will be made to qualified candidates. You can accept this offer by paying the program fee.

Talk to an Admissions Counselor

We have a team of dedicated admissions counselors who are here to help guide you in applying to the program. They are available to:

- ✓ Address questions related to the application

- ✓ Assist with financial aid (if required)

- ✓ Help you resolve your questions and understand the program

IIT KANPUR
Indian Institute of Technology Kanpur

simplilearn

Program Outcomes

Understand blockchain technology and key concepts such as cryptography and cryptocurrency.

Understand blockchain technology and key concepts such as cryptography and cryptocurrency concepts

Architect and develop applications on Ethereum Blockchain

Get a deeper understanding of Bitcoin and its network

Learn about consensus, transactions, work flows, and networks

Understand what distributed ledger and hyperledger means

Get hands-on experience with a capstone on industry-relevant use cases

Understand and learn about smart contracts

Who Should Enroll in this Program?

This program caters to graduates in any discipline and working professionals from diverse backgrounds and basic programming knowledge is good to have. The diversity of our students adds richness to class discussions and interactions.

The Blockchain market is expected to reach USD 39.7 billion by 2025, at a growth rate of 67.3 percent. This program prepares both new and experienced professionals — with a passion for blockchain and a technical background — for a thriving career in blockchain. Suitable candidates include:

- ✓ Business analysts
- ✓ Developers
- ✓ Product managers
- ✓ Project managers
- ✓ Solution architects
- ✓ Team leads
- ✓ Students

IIT KANPUR
Indian Institute of Technology Kanpur

simplilearn

Learning Path Visualization

Blockchain Certification

Gain insights into the world of Blockchain and current real-world applications.

1 **Introduction to Blockchain and Bitcoin**

2 **Learn about Ethereum**

3 **Understand Consensus, Hash**

4 **Get to know about Hyperledger Fabric**

5 **Smart Contracts and Networks**

6 **Applications of Blockchain**

7 **Capstone Project**

8 **Professional Certificate in Blockchain from IIT Kanpur**

Module 1: Fundamentals of Blockchain

Module Curriculum:

Lesson 1: Course Introduction

- ✔ What Is Blockchain?
- ✔ Features of Blockchain
- ✔ Industries Using Blockchain
- ✔ Course Outline
- ✔ Course Outcome
- ✔ Course Components
- ✔ Customer Support

Lesson 2: Introduction to Blockchain

- ✔ Challenges Faced by Modern Businesses
- ✔ What is Blockchain?
- ✔ Building Blocks of Blockchain
- ✔ Types of Blockchain
- ✔ Knowledge check

Lesson 3: Blockchain Pillars

- ✔ Introduction to Blockchain Pillars
- ✔ Cryptography
- ✔ Assisted Practice: Generate Public and Private Keys
- ✔ Assisted Practice: Send a Message Using Symmetric Cryptography
- ✔ Assisted Practice: Sign a
- Message Using Asymmetric Cryptography
- ✔ Assisted Practice: Generate Hash Using Hash function
- ✔ Consensus
- ✔ Assisted Practice: Generate a Nonce Value
- ✔ Distributed Ledger

- Assisted Practice: Working of Distributed Ledger

- Assisted Practice: Working of Blockchain Transaction

- Knowledge Check

- Lesson End Project: Create Blockchain Network

Lesson 4: Bitcoin Blockchain

- Introduction to Bitcoin

- Bitcoin Wallets

- Assisted Practice: Install a Software Wallet

- Assisted Practice: Generate a Paper Wallet

- Assisted Practice: Generate a Web Wallet

- Bitcoin Block

- Assisted Practice: Review and Analyze a Bitcoin Block on Explorer

- Bitcoin Transaction

- Assisted Practice: Analyze a Bitcoin Transaction

- Bitcoin Scripts

- Bitcoin Network

- Bitcoin Mining

- Knowledge Check

- Lesson End Project: Conduct a Transaction Using Electrum Wallet

Lesson 5: Ethereum Blockchain

- Introduction to Ethereum

- Ethereum Networks

- Assisted Practice: Exploring the Ethereum Mainnet

- Assisted Practice: Explore an Ethereum Test Network

- Assisted Practice: Install the Ganache Blockchain

- Assisted Practice: Explore the Ganache Blockchain

- Ethereum Wallets

- Assisted Practice: Install Metamask and Set up the Wallet

- Assisted Practice: Connect Metamask to a Ganache Test Network

- Assisted Practice: Install and Explore the Mist Wallet

- Ethereum Clients

- Assisted Practice: Install Geth Client

- Assisted Practice: Set up a Private Blockchain Network

- Knowledge Check

- Lesson End Project: Ether Transaction Using Ganache

Lesson 6: Enterprise Blockchain

- Enterprise Blockchain

- Hyperledger

- Hyperledger Sawtooth

- Assisted Practise: Setup Sawtooth Network and Create Basic Transactions

- Hyperledger Iroha

- Assisted Practise: Setup Iroha Network and Create Basic Transaction

- Hyperledger Indy

- Hyperledger Burrows

- Hyperledger Fabric

- Hyperledger Fabric Transaction

- Fabric Network

- Assisted Practise: Setup Hyperledger Fabric Prerequisite

- Assisted Practise: Setup Hyperledger Fabric

- Fabric Network Types

- Assisted Practise: Start and stop test network

- R3 Corda

- Corda Network

- Knowledge Check

- Lesson End Project: Transform the Supply Chain

Module 2: Blockchain Applications And Architecture

Module Curriculum:

Lesson 1: Course Introduction

- Learning Path
- Program Outline
- Course Outline
- Skills Covered

- Course Components
- Course Completion Criteria
- Customer Support

Lesson 2: Ethereum Smart Contracts

- Remix IDE
- Assisted Practice: Explore the Browser-based Remix IDE
- Assisted Practice: Connect Remix IDE to Ganache and Ropsten Test Networks
- Smart Contract Lifecycle
- Solidity
- Solidity State and Variable Types
- Solidity Functions
- Assisted Practice: Develop a Property Transfer Smart Contract
- Unassisted Practice: Develop a Library Smart Contract
- Web3

- Assisted Practice: Create a Custom Token and Deploy it on Ropsten Network
- Solidity Compilation and Deployment
- Assisted Practice: Generate the ABI and Bytecode of a Smart Contract
- Assisted Practice: Deploy a Smart Contract to Ganache Network
- Assisted Practice: Access Smart Contracts Functions from the Frontend
- Knowledge Check
- Lesson End Project: Creating a Custom Bank Contract

Lesson 3: Hyperledger Fabric Chaincode

- Chaincode
- Gradle
- Chaincode Java API
- Chaincode Development
- Assisted Practice: Set up Development Prerequisites
- Assisted Practice: Create New Gradle Project for Car Showroom
- Assisted Practice: Create Chaincode for Car Showroom
- Chaincode Package, Install, Approve
- Assisted Practice: Package the Chaincode
- Assisted Practice: Install the Chancode
- Assisted Practice: Approve the Chancode
- Assisted Practice: Commit the Chancode
- Assisted Practice: Access Chaincode Functions
- Knowledge Check
- Lesson End Project: Develop Chaincode for Property Ownership Application

Lesson 4: Hyperledger Fabric SDK

- Fabric SDK Introduction
- Assisted Practice: Create Maven Project
- Assisted Practice: Enroll Admin User
- Assisted Practice: Register and Enroll Client User
- Assisted Practice: Access Chaincode Functions
- Knowledge Check
- Lesson End Project: Access Property Ownership Chaincode using Java SDK

Lesson 5: Multichain

- Introduction to Multichain
- Multichain Installation
- Assisted Practice: Set up Multichain in the Local Machine
- Create a Multichain Instance
- Assisted Practice: Create Multichain Instance with Two Nodes
- Multichain Assets
- Assisted Practice: Create a Multichain Asset and Transfer It
- Multichain Streams

- Assisted Practice: Create a Multichain Stream to Publish Data
- Multichain Consensus
- Assisted Practice: Perform Mining in Multichain
- Multichain API
- Assisted Practice: Access Functions Using Multichain API
- Knowledge Check
- Lesson End Project: Create a Private Multichain Blockchain

Lesson 6: IOTA and Blockchain Use Cases

- Traditional Blockchain Challenges
- Introduction to IOTA
- Healthcare Use Cases
- Government Use Cases

- Finance Use Cases
- Supply Chain Use Cases
- Knowledge Check
- Creating a Decentralized Hospital Smart Contract

Capstone Projects

Capstone Project 1: Decentralized KYC Verification

Description:

Central Bank and other government banks face issues in tracking money laundering activities that are used for terrorism and other crimes. It is a threat to national security and is also adversely affecting the economy.

Background of the problem statement:

KYC (Know Your Customer) is a service provided by financial institutions such as banks. There are both public and private sector banks managed by a central bank. These banks are banned by the central bank from adding any new customer and do any more customer KYCs as they see suspicious activities that need to be sorted out first. Despite this, the banks add new customers and do the KYC in the background.

An immutable solution is needed where the central bank maintains a list of all the banks and tracks which banks are allowed to add new customers and perform KYC. It can also track which customer KYC is completed or pending along with customer details.

Banks can also add the new customer if allowed and do the KYC of the customers.

Capstone Project 2: Covid Vaccine Tracker

Description:

Track Covid vaccine recipients so that no one is missed or receives any extra dose. One of the challenges that the government is facing is people are producing fake covid vaccine certificates and infected people are spreading this further.

Background of the problem statement:

Covid vaccine is one of the crucial tools to fight against covid-19. Many countries are working at their full strength to vaccinate their citizens.

It becomes important to track who has taken the vaccine and who hasn't. Since most vaccines come in two shots, it has become equally important to track who got first short and who got both the shots.

It has become difficult to track down fake covid vaccine recipients. An immutable solution is needed where covid vaccine recipients can be tracked and updated as and when they receive the first or second shot.

Capstone Project 3: Decentralized College Tracker

Description:

It is becoming really difficult to track down illegal colleges. Many students' careers are spoiled as they enroll in them.

Background of the problem statement:

In many parts of India, illegal colleges are run, which are not affiliated to any university. Many students enroll in these colleges without knowing that and in turn they end up having no jobs or colleges get shut down after some time, which ruins their career.

An immutable solution like Blockchain is needed where all the colleges under a university are tracked as blockchain to ensure that no one can modify any old record. That same solution should also allow banning any college to enroll any new student in case there are any complaints against that college. Later remove the ban once the college addresses all the complaints.

Capstone Project 4: Mango Supply Chain

Description:

Many people across the globe are getting sick due to the lack of food hygiene. A better tracking technique is required to trace back the origin of the food item so that the end user can authenticate food items and consume them without any worry.

Background of the problem statement:

Food quality and safety is one of the hot topics today where everyone is concerned about the food quality that they are consuming.

Food items like fruits generally don't have any expiry date mentioned so it becomes really important to understand the origin of these food items and understand when the farmer sent it to the distributor and so on. Generally, the below cycle is followed in supply chain for fruit items:

1. Producer: The producer can harvest fruits, sell them to distributors, and track authenticity.

2. Distributor: The distributor can buy the fruits, distribute them, and track authenticity.

3. Retailer: The retailer can buy the fruits, put them for sale, and track authenticity.

4. Consumer: The consumer can buy the fruits and track authenticity.

Certification
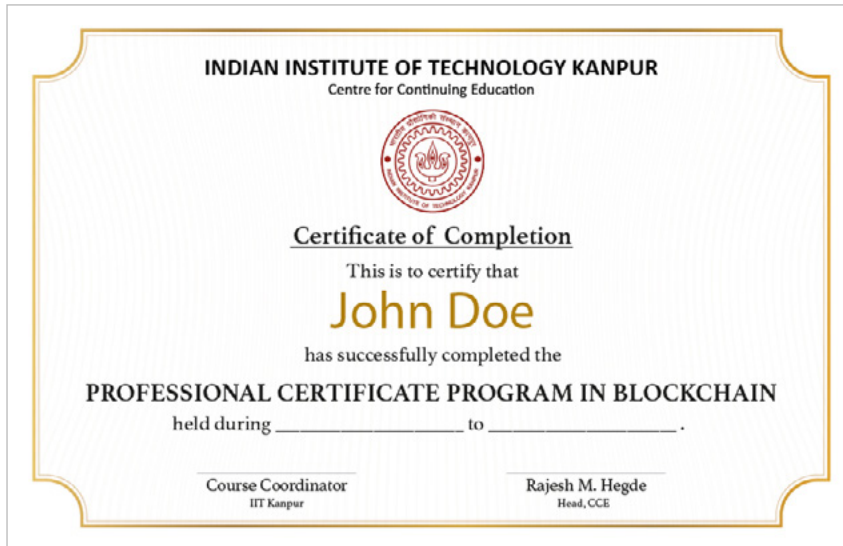
Upon completion of this Blockchain Certification Training Program, in partnership with IIT Kanpur, you will receive the Blockchain Certification from IIT Kanpur. This certificate will testify to your skills as a blockchain expert.

Advisory Board Members

Sandeep Shukla

Professor, Computer Science and Engineering at Indian Institute of Technology, Kanpur

Sandeep Shukla is the Coordinator, Interdisciplinary Center for Cyber Security and Cyber Defense of Critical Infrastructure, IIT Kanpur. He has a Ph.D. and MS in Computer Science from the State University of New York and 28+ years of experience as a technology professional and revered academic.

simplilearn

USA

Simplilearn Americas, Inc.
201 Spear Street, Suite 1100, San Francisco, CA 94105
United States
Phone No: +1-844-532-7688

INDIA

Simplilearn Solutions Pvt Ltd.
53/1 C, Manoj Arcade, 24th Main, Harlkunte
2nd Sector, HSR Layout
Bangalore - 560102
Call us at: 1800-212-7688

www.simplilearn.com

Disclaimer: All programs are offered on a non-credit basis and are not transferable to a degree.