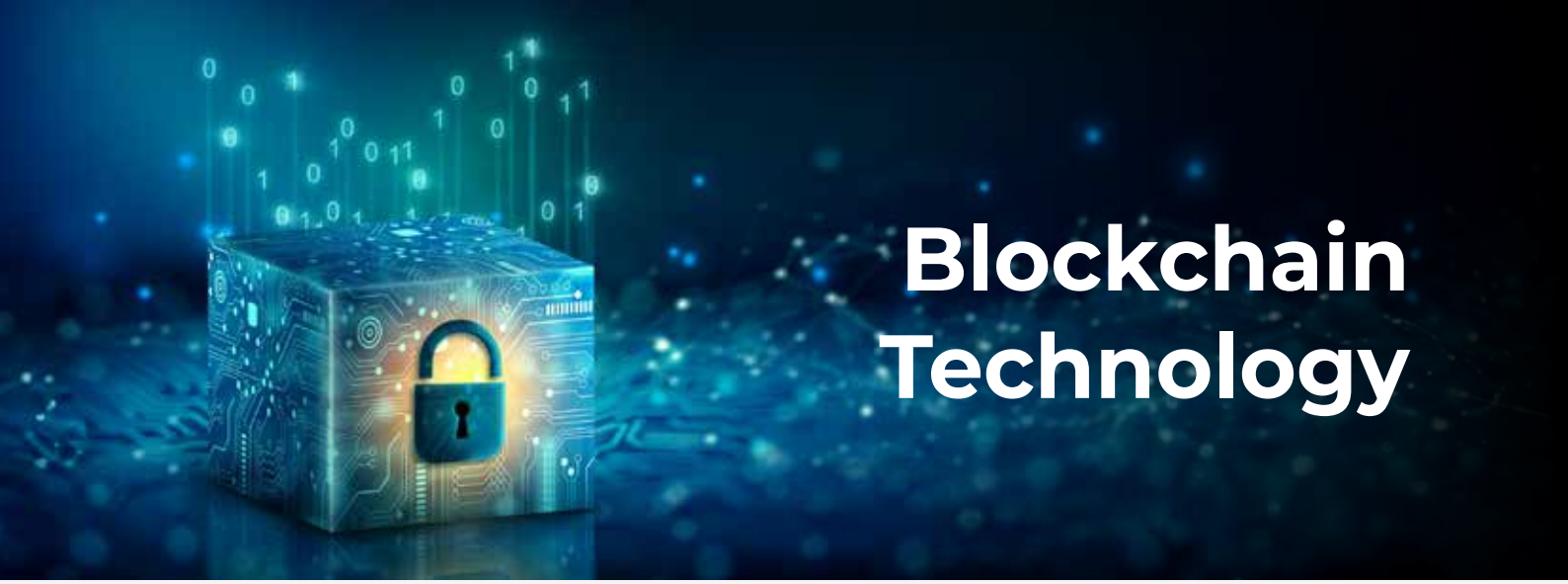
भारतीय प्रौद्योगिकी संस्थान दिल्ली
Indian Institute of Technology Delhi

Certificate Programme in Blockchain Technology

05 Months | Starts 11th January, 2025 | Live Online Lectures

Programme offered by Continuing Education Programme (CEP), IIT Delhi

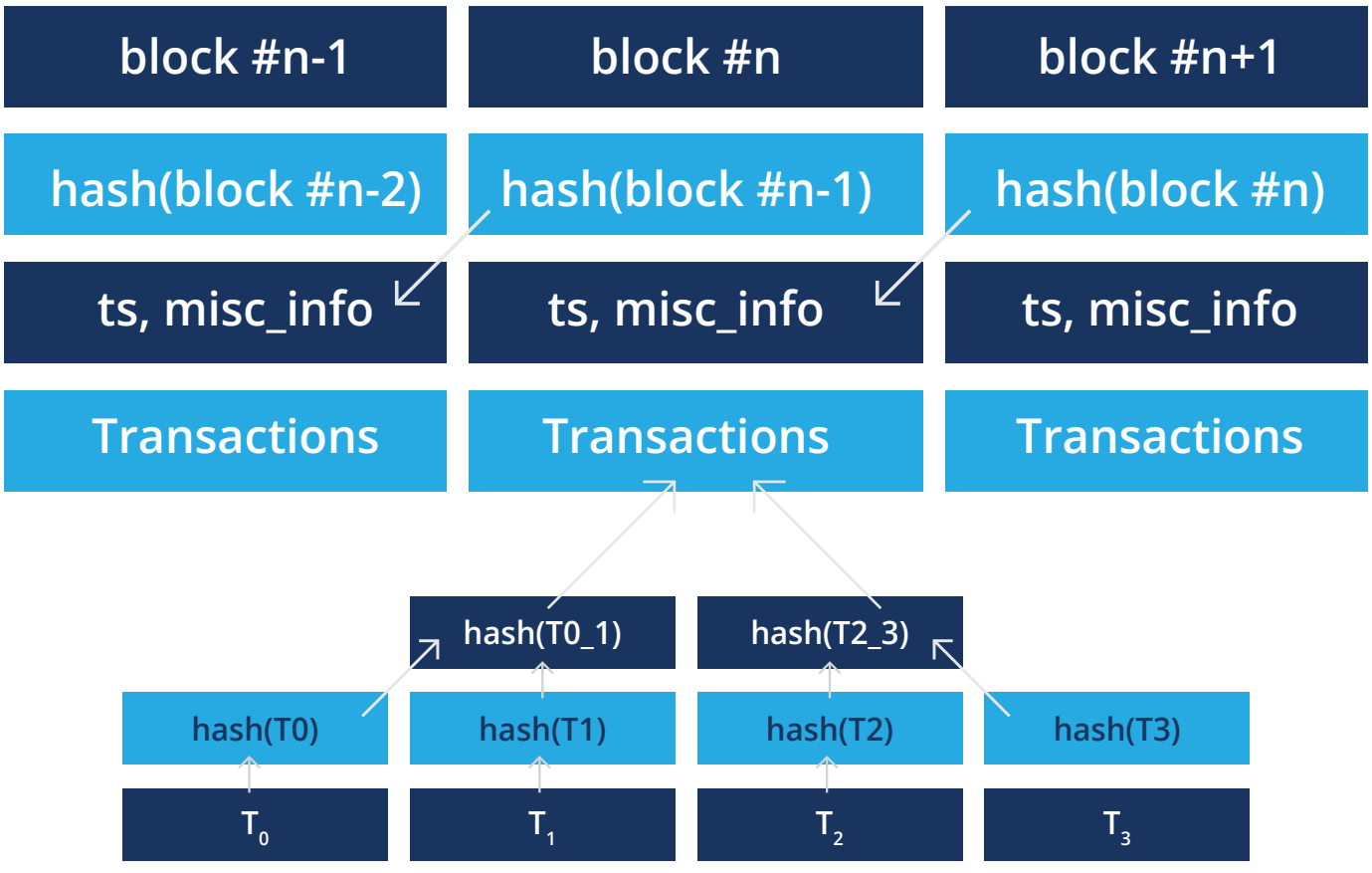


Blockchain Technology

TRUST. It's the prevailing issue when money comes into the picture. After many failed attempts at creating digital currency in the past, in 2009, Satoshi Nakamoto implemented a public ledger based cryptocurrency, Bitcoin, by using a technology called 'Blockchain'. Other well-known blockchains like Ethereum and Ripple go beyond currency, such as smart contracts, and derivative markets and so on.

Blockchain is a digital ledger of transactions, a distributed database that stores information in groups called 'blocks', and is shared across the entire network of computers on the blockchain. Each block stores several transactions and the blocks are linked using hash pointers, previously filled block, forming a chain of blocks arranged chronologically.

Blockchain is a chronological chain of blocks



Merkle tree of transactions

Types of Blockchains

01

Public blockchain: A permission-less blockchain network, where anyone can participate without restrictions

02

Private blockchain: A permissioned blockchain, where organisations set controls on who can access

03

Consortium blockchain: A blockchain network where the process is closely controlled by a preselected set of stakeholders

04

Hybrid blockchain: A combination of the private and public blockchains, where only selected records can be allowed to go public keeping the rest confidential

Advantages of Blockchain

- It is programmable
- It is a distributed/decentralised database which offers transparency
- Transactions are recorded with an immutable cryptographic signature called a hash
- Increased efficiency
- All participants can have a copy of the ledger
- Transactions/records can be encrypted to provide security and confidentiality
- Any validated record is immutable and cannot be changed
- Every transaction is time-stamped
- Identity of participants is anonymous or pseudonymous
- It is impossible to change or delete information from the ledger
- No single entity; it's run by people who use it

Endless Possibilities of Blockchain

Blockchain technology has many potential uses that go beyond fuelling cryptocurrencies.

01 Banking & Finance

- ☑ International payments
- ☑ Capital markets
- ☑ Trade finance
- ☑ Insurance
- ☑ Regulatory compliance & audit

02 Business

- ☑ Media
- ☑ Healthcare
- ☑ Real estate
- ☑ Supply Chain Management
- ☑ Energy supply transactions
- ☑ Intellectual property rights of content

03 Government

- ☑ Voting
- ☑ Taxes
- ☑ Identity management
- ☑ Record management
- ☑ Compliance/regulatory oversight
- ☑ Anti-trust problems in non-profit agencies

04 Other

- ☑ Cyber security
- ☑ Big Data
- ☑ Data storage
- ☑ Record management
- ☑ Internet of Things (IoT)
- ☑ Financial management & accounting

Source: insiderintelligence.com

Blockchain is Here to Stay

The emerging technology has gained traction only in the past few years, and is one of the fastest growing field. With the number of opportunities far exceeding qualified developers, blockchain talent is hard to find. However, a successful entry into blockchain can offer multiple career paths and growth. All you need is a certification from one of India's premier institutes. Welcome to the future!

Source: analyticsinsight.net, forkast.news

Programme Highlights

- Guest lectures by industry experts
- 42 hours of live learning with IIT Delhi Faculty
- Live tutorial sessions
- Learn industry relevant tools
- E-certificate issued by CEP, IIT Delhi
- Networking opportunity through one-day campus immersion

Who Should Attend?

- Fresh graduates with mathematics, science, or computer sciences background with career aspirations in blockchain technology
- Working professionals seeking to upskill with blockchain expertise and its applications and striving to advance to roles as Blockchain Developer, Blockchain Analyst, Blockchain Architect, Blockchain PM, etc., in various industries

Job Roles Available in Blockchain

Blockchain Developer: Designs and develops decentralised applications (dApps) and smart contracts using blockchain technology. Proficient in programming languages such as Solidity (for Ethereum) or others depending on the blockchain platform.

Blockchain Analyst: Conducts research and analysis on blockchain trends, market developments, and potential applications. Evaluates blockchain projects for feasibility and impact within specific industries.

Blockchain Architect: Designs the overall structure and architecture of blockchain systems. Defines protocols, mechanisms, and network configurations to ensure scalability, security, and efficiency of blockchain solutions.

Project Manager: Manages blockchain projects from initiation to completion. Coordinates tasks, resources, and stakeholders to ensure projects are delivered on time and within budget. Provides leadership and strategic direction throughout the project lifecycle.

Learning Outcomes

After completion of this programme, learners will be able to

- Explain the basic principles and components of blockchain technology
- Understand the implications of smart contracts in decentralised applications
- Utilise blockchain principles to architect and develop dApps
- Identify cyber security measures to ensure security of blockchain systems
- Understand the legal and regulatory landscape surrounding blockchain
- Identify potential risks associated with blockchain technology

Programme Curriculum*

Blockchain Fundamentals

- Digital Signatures
- Replicated Distributed Ledgers
- Peer to Peer Networks
- Distributed Consensus
- Consensus Protocols

Understand the core principles and concepts of blockchain technology, including its decentralised nature, transparency, immutability, and security.

Cryptocurrencies

- BITCOIN
- Cryptocurrencies
- Ecosystems
- Future for Cryptocurrencies
- Risks and Legalities of Cryptocurrencies
- Mining

Understand the fundamentals of Bitcoin, the first and most well-known cryptocurrency, including its history, principles, and underlying technology.

Ethereum Foundations

- Digital Wallets
- Tokens
- Ethereum Clients
- Ethereum Nodes
- Ethereum Wallets
- Smart Contracts
- Ethereum Virtual Machines

Understand the foundational principles and concepts of Ethereum, including its role as a decentralized platform for building and deploying smart contracts and decentralized applications (dApps).

Secure Solidity Programming

- Building dApps
- Smart Contract Lifecycle Solidity
- Solidity Variables
- Solidity Compilation
- Deployment of Solidity Functions

Gain proficiency in building decentralised applications (dApps) using Solidity and the Ethereum platform, including designing, coding, testing, and deploying smart contracts.

Development Tools

- Waffle-testing Framework
- Metamask
- Truffle
- Remix IDE
- Etherscan – Blockchain Explorer
- NODE JS
- CORDA
- Cloud Orchestration
- Hardhat
- Foundry

Understand the concept of enterprise blockchain and its applications in various industries and Gain proficiency in using Hyperledger, an open-source blockchain platform, to develop and deploy enterprise-grade blockchain solutions.

Enterprise Solution and Use cases

- Hyperledger Fabric
- Internet of Things Application (IOTA)
- InterPlanetary File System (IPFS)

Explore the application of Hyperledger Fabric, IOTA, and IPFS in creating robust, scalable, and efficient blockchain-based solutions for enterprises.

Interoperability

- Introduction to Multichain
- Introduction to Cross chain
- Multichain Streams
- Multichain Consensus
- Multichain API

Understand the concept of multichain technology and its applications in blockchain development and gain proficiency in installing and configuring Multichain.

Capstone Project

*The curriculum may be subject to change based on the candidates' profiles and recent developments in the field.

Tools

METAMASK

TRUFFLE

REMIX IDE

SOLIDITY

vyper

node JS

Hardhat

FOUNDRY.

Assignments/Case-studies/Projects*

01

StorJ - Explore the decentralized cloud storage platform, analyzing its architecture and functionality within blockchain technology.

02

Wine Industry - investigate how blockchain technology can be applied to enhance supply chain transparency, authenticity verification, and traceability.

03

Blockchain Based Electronic Voting Protocol Implementation – Make sure how the vote secrecy is guaranteed through privacy preserving blockchain

04

Simplify shipping process having blockchain based system – Design a blockchain-based system to streamline logistics, enhance transparency, and improve efficiency.

*The projects/case studies/ assignments are subject to change.

Career Support

Personal Branding
- Introduction to networking platforms
- Profile creation on professional networking
- platforms like LinkedIn, Lunchclub etc.
- LinkedIn Profile Review
- How to create personal brand presence on LinkedIn?
- How to increase post engagement on LinkedIn?
- Active networking

Business Communication
- Role and importance of effective communication as a leader
- The art of providing constructive feedback for successful team
- Importance of non-verbal communication
- Key elements of executive body language

Job Search Strategy
- Resume Creation
- Importance of creating ATS friendly executive resume
- Executive resume sections and structure
- Tailoring resumes for different roles and industries
- Write a powerful resume that stands out from the competition
- Resume Review - Peer to peer review and Q&A

Interview Preparation
- Pre-interview Etiquettes
  - Learn about top-down approach for interviews
  - Pre-interview tips and tricks
- In-interview Etiquettes
  - Create a self-elevator pitch
  - Understanding interviewer mindset
  - Interview grooming sessions and tips and tricks for interview
- Post-interview Etiquettes
  - Reflecting on interview experience and incorporating the feedback
  - Relationship building with the recruiter
  - Learn how to follow up on your job application

Note: Career support facility is offered by TimesPro. IIT Delhi is not responsible for the same.

Programme Details

Eligibility

- Graduates or Postgraduates in Science, Technology, Engineering, or Mathematical Sciences
- Prior coding knowledge required

Delivery

- Online in Direct-to-Device (D2D) mode

Duration: 5 Months

- 42 hours of live online sessions
- 30 hours of live tutorials
- 72 hours self-paced learning
- 20 hours capstone project
- 10 hours optional campus immersion

Class Schedule

Tuesday and Thursday – 8:00PM-9:00PM (Subject to change)

Admission Criteria

Selection is based on application review.

Campus Immersion

An offline 1-day campus immersion for interaction between faculty and learners at IIT Delhi campus (optional for learners to attend).

Evaluation Criteria

- 60% - End of programme MCQ-based exam
- 30% - Assignments and project
- 10% - Attendance

Certification

- Candidates who score at least 30% marks overall and have a minimum attendance of 50%, will receive a ‘Certificate of Completion’ from CEP, IIT Delhi.
- Candidates who score less than 30% marks overall and have a minimum attendance of 50%, will receive a ‘Certificate of Participation’ from CEP, IIT Delhi.
- The organising department of this programme is Department of Computer Science and Engineering, IIT Delhi.

*Only e-certificates will be issued by CEP, IIT Delhi for this programme.

Programme Coordinator

Prof. Subodh Sharma

Associate Professor and Pankaj Gupta Chair Professor
in Privacy and Decentralisation,
Associate Dean of Outreach and New Initiative,
Department of Computer Science and Engineering,
Indian Institute of Technology Delhi

Professor Subodh Sharma is an Associate Professor at the Department of Computer Science and Engineering, Indian Institute of Technology Delhi. He holds the Pankaj Gupta Chair Professorship in Privacy and Decentralisation and he is also the Associate Dean of outreach at IIT Delhi. His research primarily lies in the areas of software engineering and formal methods. He is interested in ensuring the reliability and security of parallel software via static and dynamic programme analyses, model checking, and PL solutions. He is also interested in employing HPC towards the creation of scalable verification technology. His recent investigations have been focused on securing electronic voting protocols, ensuring privacy and purpose limitation in critical public-facing software systems. Interestingly, the security and privacy of people-centric technologies also come with a plethora of tech-policy issues. He is interested in exploring avenues relating to personal data protection, mechanised access control mechanisms, and their policy implications.

Programme Fee

Particulars	Amount (₹)
Programme Fees	1,29,000/-
GST @18%	23,220/-
Total Fees	**1,52,220/-**

Note:
• All fees should be submitted in the IITD CEP Account only, and the details will be shared post-selection.
• The receipt will be issued by the IIT Delhi CEP account for your records.
• Easy EMI options available.
• Loan and EMI Options are services offered by TimesPro. IIT Delhi is not responsible for the same.

Withdrawal and Refund
• Candidates can withdraw within 15 days from the programme start date. A total of 80% of the total fee received will be refunded. However, the applicable tax amount paid will not be refunded on the paid amount.
• Candidates withdrawing after 15 days from the start of the programme session will not be eligible for any refund.
• If you wish to withdraw from the programme, you must email cepaccounts@admin.iitd.ac.in and icare@timespro.com, stating your intent to withdraw. The refund, if applicable, will be processed within 30 working days from the date of receiving the withdrawal request.

Instalment Schedule		
Component	**Date**	**Amount (₹)****
Registration Fee*	To be paid at the time of registration	10,000
1st Instalment	Within one-week of offer-rollout	41,000
2nd Instalment	25th February, 2025	39,000
3rd Instalment	10th April, 2025	39,000

Note:
• *Registration fee of ₹10,000 will be charged for processing the selected applications only, post confirmation email from the institute. The registration fee is also part of the total programme fee.
• An offer letter from CEP, IIT Delhi will be released post the successful receipt of the Registration Fee.
• **GST@ 18% will be charged extra in addition to the fee.

Programme Timelines	
Application Closure Date	17th December, 2024
Programme Start Date	11th January, 2025
Programme End Date	February 2025

APPLY NOW

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Indian Institute of Technology Delhi

The Indian Institute of Technology Delhi (IIT Delhi) is one of the 5 initial IITs established for training, research, and development in science, engineering, and technology in India. Established as the College of Engineering in 1961, the Institute was later declared an Institution of National Importance under the "Institutes of Technology (Amendment) Act, 1963" and was renamed as "Indian Institute of Technology Delhi". It was then accorded the status of a Deemed University with powers to decide its own academic policy, conduct its own examinations, and award its own degrees. Since its inception, over 48,000 students have graduated from IIT Delhi in various disciplines including Engineering, Physical Sciences, Management, and Humanities & Social Sciences.

For more details, please visit: www.iitd.ac.in

Continuing Education Programme (CEP)

Executive education is a vital need for companies to build a culture that promotes newer technologies and solutions and builds a workforce that stays abreast of the rapidly transforming needs in the technological, business, and regulatory landscape. Committed to the cause of making quality education accessible to all, IIT Delhi has launched Online Certificate Programmes under eVIDYA@IITD (ई-वद्या@IITD), enabling Virtual and Interactive learning for Driving Youth Advancement @IITD for Indian as well as international participants.

These outreach programmes offered by the Indian Institute of Technology Delhi (IIT Delhi) are designed to cater to the training and development needs of various organisations, industries, society, and individual participants at national and international levels with a vision to empower thousands of young learners by imparting high-quality Online Certificate Programmes in cutting-edge areas for their career advancement in different domains of engineering, technology, science, humanities, and management.

For more details, please visit: http://cepqip.iitd.ac.in

#2 in NIRF India Engineering Rankings 2024

#2 QS World University Rankings 2024 in India

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1800-120-2020 | admissions@timespro.com | timespro.com

For any feedback, please write to:
CEP, IIT Delhi at
contactcep@admin.iitd.ac.in

Online Certificate Programmes are offered by the Indian Institute of Technology Delhi under the aegis of Continuing Education Programme (CEP) so that the Institute can realise its vision of serving as a valuable resource for industry and society, and fulfil its mission to develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge in a range of professions.

Programme offered by Continuing Education Programme (CEP), IIT Delhi