



**ASSOCIATION OF ALL
COMPUTER SCIENCE TEACHERS (AACST)**
कॉम्प्यूटर विज्ञान शिक्षक संघ [Reg. No: Nagpur/0000492/2023]
September 2023

**REPORT
ON
NATIONAL LEVEL ONLINE WORKSHOP
BLOCKCHAIN BOOTCAMP: DEVELOPING SMART CONTRACTS
24TH TO 28TH FEBRUARY 2025**

**ORGANIZED BY
AACST BANGALORE UNIT**

**MENTOR:
DR. ABHA KHANDELWAL
FOUNDER, AACST**

**WORKSHOP CONVENER:
DR. CHITRA RAVI
AACST BANGALORE UNIT EVENT COORDINATOR**



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कॉम्प्यूटर विज्ञान शिक्षक संघ (Reg. No: Nagpur/0000492/2023) September 2023

ONLINE WORKSHOP

BLOCKCHAIN BOOTCAMP : DEVELOPING SMART CONTRACTS

Date: 24th to 28th February 2025
Time: 6:30 to 8:00 pm
Mode: Online - Google Meet

Targeted Audiences: Students / Teachers

Registration Fee: Rs. 599/-
Earlybird Registration: Rs. 499/-
AACST Members: Rs. 399/- (20% Disc.)

Mentor: Dr. Abha Khandelwal, Founder, AACST, Nagpur
Convener: Dr. Chitra Ravi, AACST Bangalore Unit Event Coordinator, Bangalore

Resource Persons:
 Dr. Abha Khandelwal, Founder, AACST
 Dr. Chitra Ravi, Research Director, Cybersena (R&D) India Pvt. Ltd., Bangalore
 Dr. Vijayalakshmi A Lepakshi, Associate Professor, Reva University, Bangalore
 Dr. Melita Luke, Associate Professor, Yenapoya University, Bangalore
 Dr. Umadevi R, Associate Professor, CMR University, Bangalore

Content Coverage

1. Basic blockchain concepts
2. Solidity programming
3. Ethereum Blockchain development framework
4. Developing Smart contracts
5. Case Studies: Healthcare, Banking

QR Code for Reg. Fee Payment.



QR Code for Registration Form.



Registration Link: <https://forms.gle/EgTzLrTaUfDj6Exd6>

Workshop Highlights:

- Expert led interactive sessions
- Hands-on: Smart contract development tool usage
- Course completion certificate

Course Outcomes:

- Understanding Blockchain Fundamentals
- Proficiency in Smart Contract Development
- Application of Blockchain in Real-world Scenarios



ONLINE WORKSHOP

BLOCKCHAIN BOOTCAMP: DEVELOPING SMART CONTRACTS

Date: 24th to 28th February 2025

Time: 6:30 to 8:00 pm

Target Audience: Students/Faculty members/Research scholars

Content coverage

1. Blockchain Fundamentals
2. Solidity for Smart contract development
3. Smart contracts: The Backbone of Blockchain Applications
4. Building Smart contracts in Ethereum
5. Blockchain in Cryptography
6. Blockchain in Action: Use cases across sectors

Highlights:

1. Course completion certificate will be provided.
2. Expert led sessions
3. Hands-on - Blockchain smart contract development framework

Registration Fee: Rs. 599/-

Early Bird Registration: Rs. 499/- (until 18th February 2025)

AACST members : Rs. 399/-

Registration Link: <https://forms.gle/EgTzLrTaUfDi6Exd6>

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Event Overview:

The National Level Online Workshop on cutting edge technology, “**Blockchain Bootcamp: Developing Smart Contracts**” was organized by AACST Bangalore Unit successfully from 24th February to 28th February 2025, 6:30 to 8:00 PM. The workshop attracted 84 participants, including Principal, HOD, faculty members, research scholars and students.

This cutting-edge workshop was designed to equip participants with practical skills in blockchain technology, especially focussing on smart contract development using solidity programming and web based blockchain development framework called Remix IDE. This workshop offered a unique opportunity to dive deep into the transformative potential of blockchain technology and development of Decentralized applications through Smart contracts.

Number of participants: 84

Target Audience: Students/Professors/Heads of Departments/Principal

Mentor: Dr. Abha Khandelwal, Retired Head, Dept of Computer Science, Hislop College, Nagpur & Founder, AACST

Workshop Convener: Dr. Chitra Ravi, Research Director, Cybersena (R&D) India Pvt. Ltd., Bangalore & AACST Bangalore Unit Event Coordinator

Resource persons:

1. Dr. Chitra Ravi, Director, Cybersena (R&D) India Pvt. Ltd., Bangalore
2. Dr. Umadevi Ramamoorthy, Associate Professor, CMR University, Bangalore
3. Dr. Melita Luke, Associate Professor, Yenapoya University, Bangalore
4. Dr. Vijayalakshmi A Lepakshi, Associate Professor, School of Computer Science and Applications, Reva University, Bangalore
5. Dr. Abha Khandelwal, Retired Head, Dept of Computer Science, Hislop College, Nagpur & Founder Director, AACST

Session Chairpersons:

1. Dr. Kumar Chandar, Associate Professor, School of Business and Management Studies, Christ University, Bangalore
2. Dr. Chitra K, Associate Professor, Dayanand Sagar Academy of Technology and Management
3. Dr. Sabarmathi, Assistant Professor, School of Business and Management Studies, Christ University, Bangalore
4. Dr. Pratibha Rashmi, Assistant Professor, Dr. Bhimrao Ambedkar University, Agra
5. Dr. Manjula Sanjay, Professor & HOD, Dayandand Sagar Academy of Technology and Management

Master of Ceremony:

1. Ms. Shruthi C Karigar

Valedictory function

Chief Guest :

Mr. Shadab Hussain, Senior Associate at MathCo, California, USA

Guest of Honour:

Mr. Vishwajeet Sachan, Co Founder, Validium Network, Lucknow, UP, India

Course Contents:

Session 1: Blockchain Fundamentals

1. Introduction to Blockchain
2. Need for Blockchain
3. Blockchain Architecture
4. Consensus mechanisms
5. Working of Blockchain
6. Types of Blockchain
7. Programming Languages for Blockchain
8. Blockchain Development Frameworks
9. Conclusion

Session 2: Smart Contracts: The Backbone of Blockchain Applications

1. Introduction
2. Types of Smart Contracts
3. Life cycle of smart contract
4. Working of Smart Contracts
5. Structure of Smart contract program
6. Case Studies of Smart Contract
7. Conclusion

Session 3: Solidity Basics for Smart Contract Development

1. Introduction
2. Solidity Programming Overview
3. Solidity Data Types and Variables
4. Operators In Solidity
5. Control Structures in Solidity
6. Functions, Visibility, And Modifiers
7. Storage Vs. Memory Variables in Solidity
8. Solidity Inheritance
9. Interfaces In Solidity
10. The Online Platform “Remix”
11. Programs Demonstration

12. Conclusion

Session 4: Building Smart Contracts on Ethereum

1. Introduction
2. Gas and Gas fees
3. Gas Fees Calculation
4. Working of Smart Contracts
5. Remix IDE
6. Building Smart Contract on Remix IDE
7. Banking Use case Demonstration
8. Healthcare Use case Demonstration
9. Conclusion

Session 5: Blockchain in Cybersecurity

1. Introduction to Cryptography & Blockchain
 - Definition of Cryptography
 - Historical Evolution: From ancient ciphers to modern-day encryption
 - Importance of Cryptography in Securing Digital Transactions
2. Core Cryptographic Concepts in Blockchain
 - Public-Key Cryptography (Asymmetric encryption using public and private keys)
 - Hash Functions (SHA-256) (Ensuring data integrity and security)
 - Merkle Trees (Efficiently verifying large sets of transactions)
3. Public-Key Cryptography & Blockchain Security
 - How encryption protects transactions
 - Preventing double-spending in digital currency
 - Symmetric vs. Asymmetric Encryption
4. Hash Functions in Blockchain (SHA-256 & Avalanche Effect)
 - How hashing secures blockchain transactions
 - Properties of SHA-256:
 - Deterministic Output
 - Fixed Output Length
 - Pre-image Resistance
 - Collision Resistance
 - Avalanche Effect
 - Example: Bitcoin transaction hashing
5. Proof of Work (PoW) in Blockchain
 - How PoW secures the network
 - Steps in Mining:
 1. Collect transactions
 2. Solve cryptographic puzzles
 3. Validate blocks

4. Add to blockchain
 - Miners' Role & Rewards
6. Nonce & Mining in Blockchain
 - Nonce (Number Used Once) in Mining
 - How Miners Solve PoW Challenges
 - Example: Finding a valid nonce in Bitcoin mining
7. Merkle Trees & Data Integrity in Blockchain
 - Structure of a Merkle Tree
 - How Merkle Trees enable efficient verification
 - Example: How Ethereum verifies transactions with Merkle Proofs
8. Cryptographic Security in Blockchain
 - How cryptographic techniques ensure immutability, transparency, and decentralization
 - Role of timestamps in ensuring chronological order of transactions
 - Blockchain validation mechanisms
9. Blockchain Prototype & Python Simulation
 - Simple Python Blockchain Demo
 - How blockchain ensures integrity in real-world applications
10. Conclusion

Course Highlights:

1. Sessions led by expert faculty members
2. Exploration of cutting-edge technology
3. Hands on experience with Solidity programming and web-based Remix IDE Ethereum framework
4. Course completion certificate
5. All session Video Recordings posted in Google Classroom.
6. At the end of each session, Assessment was conducted in the form of Quiz.

Course Outcomes:

1. Understand foundational key concepts of Blockchain Technology
2. Understand Smart contracts, their types, working, life cycle, Program structure, Case Studies
3. Skill of Solidity programming language to develop smart contracts
4. Ability to develop, test and deploy smart contracts on Remix IDE for banking and healthcare applications
5. Understand cryptography concepts in Blockchain

Recorded Lectures: Were made available on Google Classroom for revision before assessment.

Assessment and Certification

Participants were assessed through quiz and required to maintain 75% attendance. Participation certificates were awarded to those meeting the criteria.

Valedictory Function

The valedictory function was organized on 28th February 2025. It was attended by all participants, resource persons and session chairpersons. The Chief Guest was Mr. Shadab Hussain, Senior Associate at MathCo, California, USA and the Guest of Honour was Mr. Vishwajeet Sachan, Co Founder, Validium Network, Lucknow, UP, India.

Dr. Chitra Ravi, Research Director, Cybersena (R&D) India Pvt. Ltd, Bangalore, AACST Bangalore Unit Event Coordinator and Workshop Convener, presented a report on the 5 day National level online Workshop proceedings.

About 4 participants and 1 resource person gave their oral feedback about the various sessions of the workshop, shared their thoughts and reflections in the form of learnings, networking, experiences and key takeaways requesting for conducting more such workshops in niche areas.

Participants have also given feedback through Google forms where they have rated each session as Excellent and Very Good.

Dr. Abha Khandelwal gave her closing remarks and attributed the success of the workshop to all the resource persons and participants who were very enthusiastic and interactive. She appreciated all those who were involved in the workshop and asked us to carry this knowledge forward and delve deeper into blockchain technologies and to contribute to innovation.

Dr. Chitra Ravi, Workshop convener proposed the vote of thanks. She thanked the Chief Guest and Guest of Honour of the Valedictory function, Chairpersons of all sessions, Resource persons of all sessions, Mentor of workshop for her continuous support and being the driving force, Master of Ceremony for her seamless coordination and engaging presence, Designer of Workshop flyer and certificate and all the participants for their active participation and engagement.

Summary of the Report:

The title “Blockchain Bootcamp : Developing Smart Contracts” was coined by Dr. Chitra Ravi, Workshop Convener.

An enthusiastic team of life members of AACST, were chosen as resource persons from Nagpur and Bangalore. The resource persons for the workshop on blockchain made an immense, insightful, and impactful contribution. Their profound, up-to-date, and in-depth knowledge provided comprehensive, practical, and thought-provoking insights into blockchain technology. With their engaging, articulate, and interactive delivery, they ensured a clear, structured, and enriching learning experience.

The Master of Ceremony for all 5 days is Ms. Shruthi C Karigar, who conducted the sessions exceptionally well, demonstrating a charismatic, eloquent, engaging, and poised presence.

The immersive workshop was a dynamic and thought-provoking event that brought together a diverse group of 84 brilliant students, researchers, faculty members, and Principals from across various states of India to grasp the skill of developing smart contracts using Solidity programming on Ethereum through web based Remix IDE framework.

Each session in this bootcamp was carefully designed to build our knowledge progressively beginning from basic concepts, to smart contracts to solidity programming to Remix IDE blockchain development framework and various use cases diving deeper into real world applications. Understanding Blockchain was a journey that was exciting and enriching.

The success of this workshop is attributed to:

- The constant support and motivation provided by our Mentor Dr. Abha Khandelwal, Retired Head, Dept. of Computer Science, Hislop College, Nagpur & Founder AACST
- The expertise and dedication of our esteemed faculty, who provided clear and engaging instruction.
- The enthusiasm and active participation of all attendees, who demonstrated a strong commitment to learning.

This bootcamp has not only provided us with valuable technical skills but also ignited a passion for blockchain technology.

The success of this workshop is attributed to:

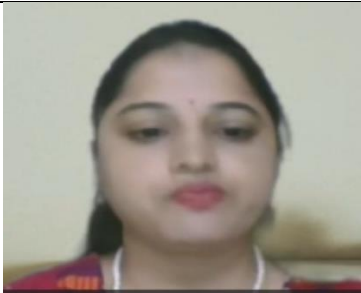
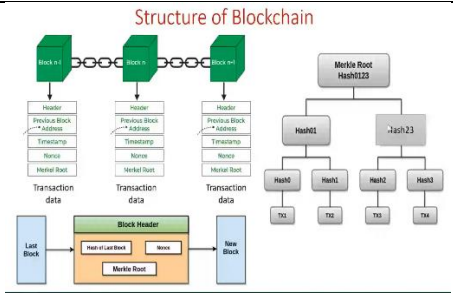
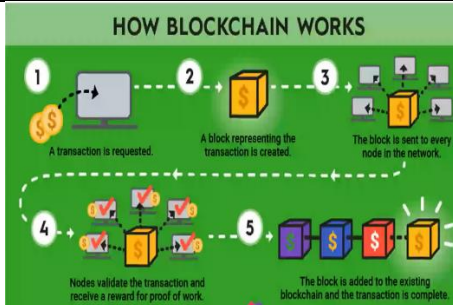
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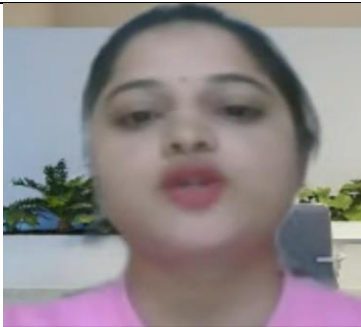
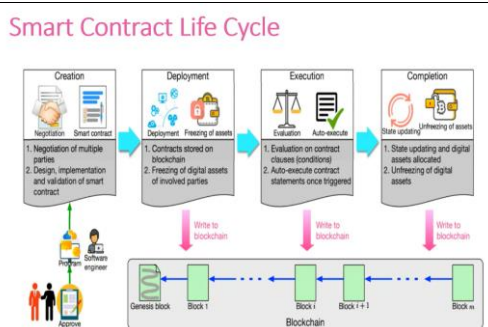
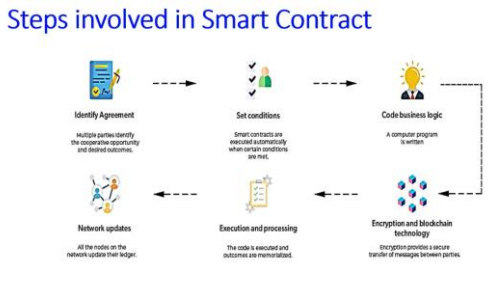
The skills acquired during this bootcamp will empower participants to:

- Contribute to the development of innovative blockchain solutions.
- Explore career opportunities in the burgeoning blockchain industry.
- Apply blockchain technology to solve real-world problems.

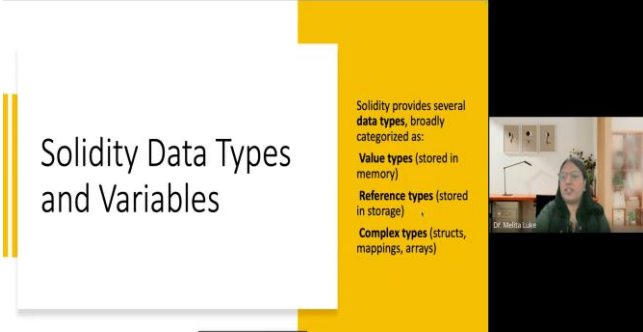
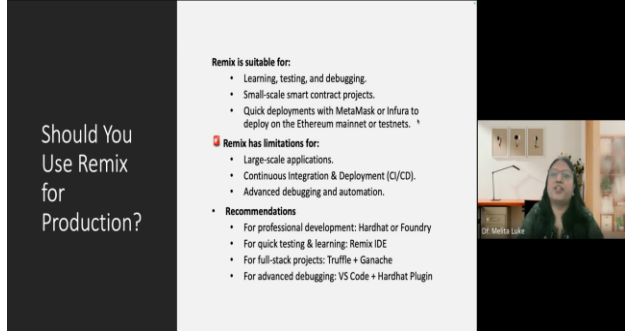
Gallery:**Day 1: 24th February 2025 6:30 to 8:00 PM**

		
Master of Ceremony Shruthi C K	Workshop Mentor Dr. Abha Khandelwal	Session snapshot
		
Resource person Dr. Chitra Ravi	Chair person Dr. S Kumar Chandar	Session snapshot

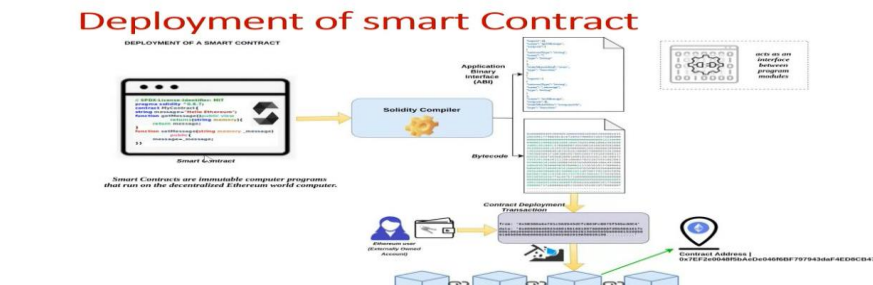
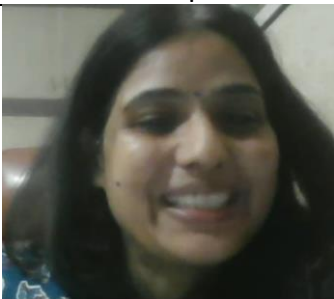
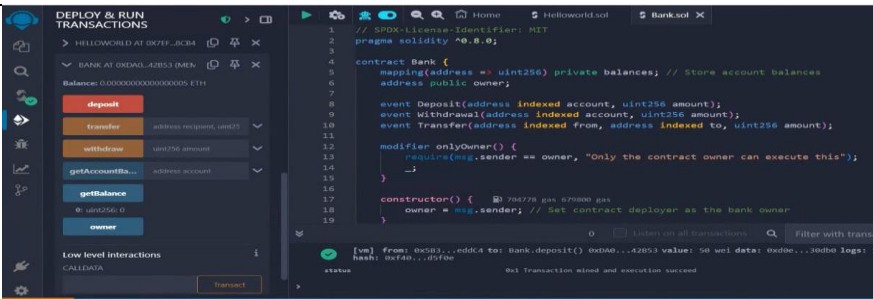
Day 2: 25th February 2025 6:30 to 8:00 PM

		
Master of Ceremony Ms. Shruthi C K	Workshop Convener Dr. Chitra Ravi	Session snapshot
		
Resource person Dr. Umadevi R	Chairperson Dr. S B Kishor	Session Snapshot and participants

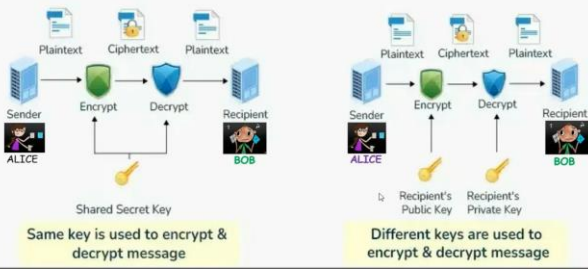
Day 3: 26th February 2025 6:30 to 8:00 PM

	
Dr. Melita Luke Resource person	Prof. Sabarmathi Chairperson
	
Session Screen shot 1	Session screen shot 2

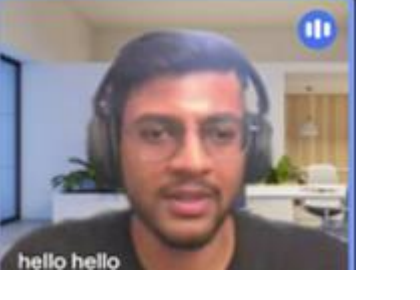
Day 4: 27th February 2025 6:30 to 8:00 PM

	
Dr. Vijayalakshmi A Lepakshi Resource person	Session participants
	
Dr. Pratibha Rashmi Chairperson	Session screenshot

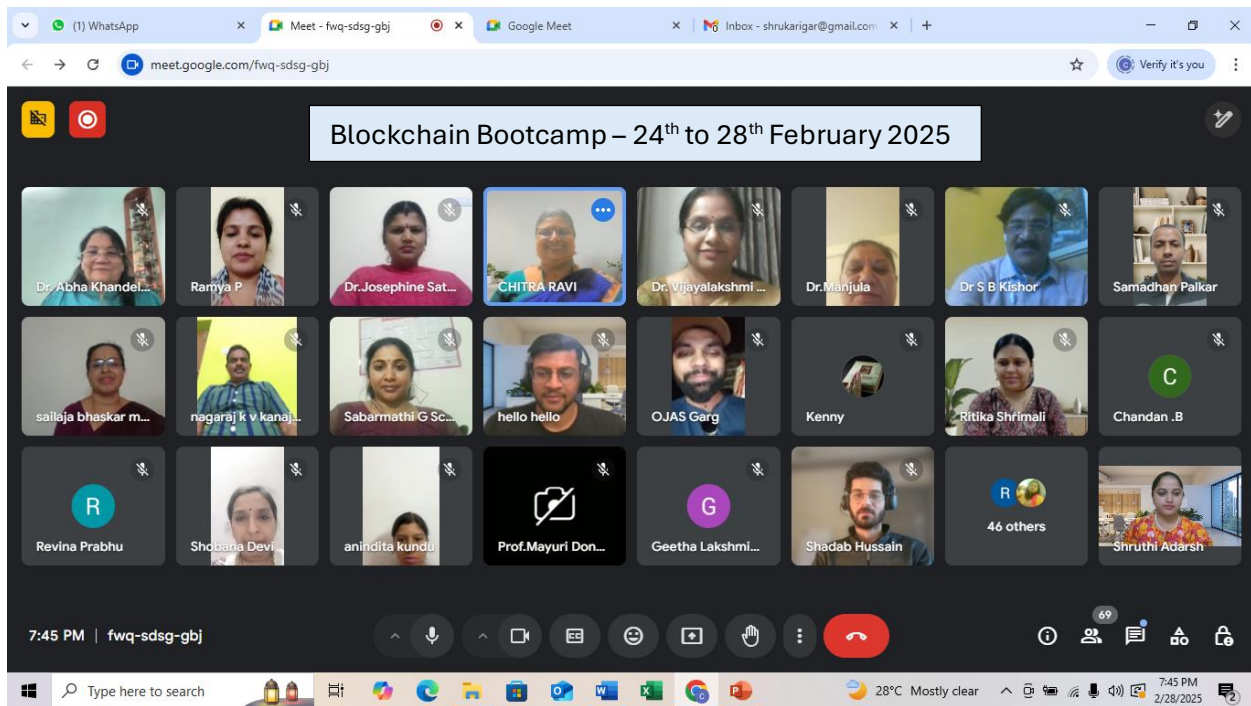
Day 5: 28th February 2025 6:30 to 8:00 PM

	Difference Between Symmetric and Asymmetric Key Encryption  Same key is used to encrypt & decrypt message Different keys are used to encrypt & decrypt message	
Dr. Abha Khandelwal Resource person	Session screenshot 1	
	◆ Essential cryptographic techniques used in blockchain: 1. Public-Key Cryptography – Uses two keys for secure communication 2. Hash Functions (SHA-256) – Generates unique digital fingerprints. 3. Merkle Trees – Efficiently verifies large sets of transactions.	
Dr. Manjula Sanjay Chairperson	Session screenshot 2	

Valedictory Function: 8:00 to 8:30 PM

	
Dr. Chitra Ravi Workshop Convener	Dr. Abha Khandelwal Workshop Mentor
	
Mr. Shadab Hussain Senior Associate, MathCo, USA Chief Guest	Mr. Vishwajeet Sachan Cofounder, Validium Network Guest of Honour





Feedback from Participants and Resource person:



Blockchain Bootcamp – 24th to 28th February 2025

Certificate Design:**Conclusion:**

The 5-day national level online workshop on "**Blockchain Bootcamp: Developing Smart Contracts**" has been an enriching experience, fostering an in-depth understanding of blockchain technology fundamentals, solidity programming, smart contracts, developing and deploying smart contracts using solidity and Remix IDE blockchain development framework for blockchain use cases such as healthcare and banking and blockchain and cryptography.

Key takeaways include:

1. **Foundational Knowledge:** Attendees gained a comprehensive grasp of the underlying foundational principles such as Blockchain Architecture, Consensus mechanisms, Working of Blockchain, Types of Blockchain, Programming Languages for Blockchain and Blockchain Development Frameworks
1. **Hands-on Learning:** The integration of practical sessions on solidity programming and smart contracts on web based Blockchain Development framework Remix IDE gave participants a very good idea of structure of block, how it could be added to blockchain network and how

we could interact with it. The results were analysed to show various values and how blockchain could provide security, transparency and trust during transactions.

2. **Challenges:** Limitations of existing blockchain architectures and how performance could be improved with ZRollups and Validium networks were discussed by industry expert.
3. **Future Directions:** The workshop served as a catalyst for future research, collaboration, and exploration in blockchain technologies – Hyperledger Fabric and Go language to develop Decentralized applications. The event laid the foundation for student's projects, research and development aimed at arriving at various solutions to problems from various domains.

In conclusion, the workshop has empowered participants to carry out projects and research in blockchain. The knowledge and skills acquired during these 5 days will equip students, researchers, faculty members and professionals, to explore further and contribute meaningfully to the advancement of blockchain technologies and for some to make a career in the field.

Report Prepared By:

DR. CHITRA RAVI

RESEARCH DIRECTOR, CYBERSENA (R&D) INDIA PVT. LTD., BANGALORE

AACST BANGALORE UNIT EVENT COORDINATOR

WORKSHOP CONVENER