



# Karmayogi Institute of Technology (Polytechnic),

Shelve-Pandharpur Solapur, Maharashtra, India

Affiliated to MSBTE, Mumbai, Approved by DTE & AICTE, Delhi, Established in 2008



Tribute to Late Shri  
Sudhakar Paricharak  
॥कर्मयोगी॥

## DEPARTMENT OF COMPUTER TECHNOLOGY

TECHBITE

15 September, 2025 | Volume: 07, Issue: 01

### Institute Vision

To provide affordable and quality engineering education primarily to rural communities, empowering them to become proficient professionals.

### Institute Mission

- To equip students with necessary technical capacity to tackle professional challenges effectively.
- To foster a conducive environment for rapid and qualitative learning.
- To provide high-quality infrastructure and facilities to students and staff.
- To consider the socio-economic status of students, enabling them to gain confidence and societal status.
- To dedicate sustained efforts towards preparing students for success in competitive examinations.

### Department Vision

To attain academic excellence in computer technology and produce proficient engineers with moral values.

### Department Mission

- To make use of best teaching-learning methodology to impart quality education in computer technology.
- To provide a learning environment to enhance ability of students to accept latest trends in computer industry.
- To establish industry interaction program to get exposure of corporate work culture.
- To groom our students to become followers of professional and ethical practices.

### From the Chairman's Desk

"Our institute is dedicated to shaping students into skilled engineers and responsible citizens. I believe that the TECHBITE newsletter will inspire and guide us towards the continued success."

- Shri. Rohan Paricharak



### From The Principal's Desk

"A newsletter is a formal publication that shares academic updates, achievements, and informative content with its readers. I am confident that this newsletter will open new opportunities and pave the way towards the desired vision and mission of our Institute. Best wishes to all the stakeholders of our institute. - Dr. Ajit Kanase



### From the HOD's Desk

"This journey began with a small step and has now grown stronger. The newsletter reflects the achievements, activities, and efforts of our students. I sincerely thank our Honorable Principal, Dr. A. B. Kanase Sir, for his support and encouragement. I am confident that this newsletter will open new opportunities and pave the way towards the desired vision and mission of our Department." - Prof. Sachin Ghalame

### From the Chief Editor's Desk

I am delighted to present before you the latest edition of our TECHBITE Newsletter. It has been my pleasure to design and edit this issue, which reflects the academic spirit and achievements. I sincerely thank all contributors and team members for their efforts in making this issue meaningful and impactful. Happy Reading! – Sachin Bhosale

# The Backbone of the Digital Age: Networking in the 21st Century

## Abstract

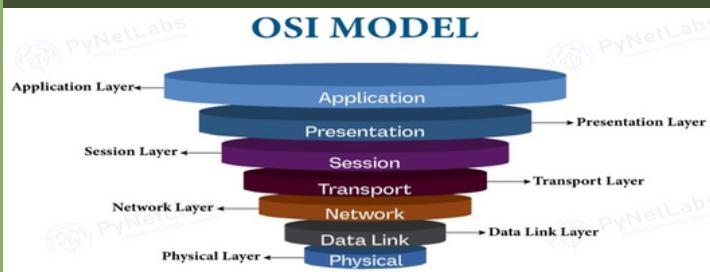
Networking forms the backbone of the digital age, enabling seamless communication, data exchange, and global connectivity. From the traditional topologies and client-server architectures to modern cloud-based infrastructures, networks have continuously evolved to meet the growing demands of efficiency, scalability, and reliability. Security remains a central concern, with advanced tools and protocols ensuring protection against ever-emerging cyber threats. As we enter an era defined by 5G, IoT, and AI-driven systems, networking stands at the forefront of technological transformation. The integration of edge computing, automation, and intelligent security frameworks will further enhance performance while addressing challenges of speed, privacy, and resilience. This explores the fundamentals, architectures, and future scope of networking, highlighting its indispensable role in shaping the connected world of the 21st century.

## Introduction

Networking is the invisible force driving the modern digital world. Every time we send a message, stream a video, or access cloud storage, countless interconnected devices and protocols work together to ensure seamless data flow. Without networking, the internet—and the technological revolution it enables—would not exist.

## 1. The Fundamentals of Networking

At its core, networking is the practice of connecting devices—ranging from smartphones and laptops to servers and IoT sensors—so they can exchange data and communicate effectively. The Open Systems Interconnection (OSI) model provides a structured framework of seven layers that govern this process, spanning from the physical transmission of bits to sophisticated application-level interactions.



## 2. Network Topologies and Architectures

The structure of a network plays a crucial role in determining its efficiency and reliability. Common topologies include:

**Star topology** – It provides centralized control but may create a single point of failure.

**Mesh topology** – It offers high redundancy and fault tolerance.

**Hybrid topology** – It combines the strengths of multiple designs for flexibility.

**Ring topology** – It ensures equal access to resources but can be disrupted if one node fails.

**Bus topology** – Simple and cost-effective but it suffers from congestion and limited scalability.

**Tree topology** – It provides hierarchical structuring, making it useful for large organizations.

**Wireless topologies** – They enable mobility and flexibility, though they require strong security measures.

In practice, modern enterprises often adopt client-server architectures or cloud-based networks, enabling scalability, resilience, and global accessibility.



## 3. Networking in the Cloud Era

Cloud networking has revolutionized how organizations design and manage their operations. Rather than relying solely on costly physical infrastructure, companies now harness virtualized resources provided by platforms such as AWS, Microsoft Azure, and Google Cloud. This shift enables elastic scalability, cost optimization, and seamless collaboration across geographic boundaries.



## 4. Security in Networking

As networks expand, so do the risks they face. Cybersecurity is essential for protecting data privacy, preventing unauthorized access, and mitigating threats such as DDoS attacks, phishing, and ransomware. Core defenses include firewalls, intrusion detection systems, and encryption, which together form the first line of protection for modern digital ecosystems.

## Conclusion

Networking is more than a technical foundation—it is the lifeline of the digital age. From everyday communication to enterprise-scale cloud computing, it connects people, systems, and ideas across the globe. With the rise of 5G, IoT, and AI-driven networks, the future holds the promise of connectivity that is faster, smarter, and more secure than ever before.

## Future Scope

Networking forms the backbone of the digital age, enabling seamless communication, data exchange, and global connectivity. From traditional topologies and client-server architectures to modern cloud-based infrastructures, networks have continuously evolved to meet the growing demands of efficiency, scalability, and reliability. Security remains a central concern, with advanced tools and protocols ensuring protection against ever-emerging cyber threats.

As we enter an era defined by 5G, IoT, and AI-driven systems, networking stands at the forefront of technological transformation. The integration of edge computing, automation, and intelligent security frameworks will further enhance performance while addressing challenges of speed, privacy, and resilience. This paper explores the fundamentals, architectures, and future scope of networking, highlighting its indispensable role in shaping the connected world of the 21st century.

# Cryptography in Blockchain

## Abstract

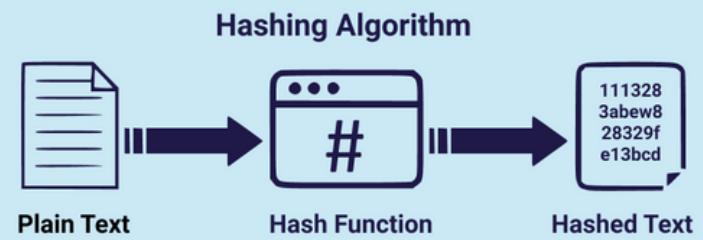
Cryptography plays a crucial role in securing blockchain networks by ensuring data integrity, authentication, confidentiality, and trustless transactions. This article discusses the importance of cryptography in blockchain, the techniques applied, and the future scope of cryptographic advancements in decentralized systems.

## Introduction

Blockchain technology is a decentralized ledger that records transactions across multiple nodes without a central authority. The foundation of its security and trust lies in cryptography. By applying advanced cryptographic algorithms, blockchain guarantees tamper resistance, secure identity management, and privacy protection, making it suitable for applications such as Cryptocurrencies, Supply Chain Management, Healthcare, and Digital Identity Verification.

## Important Highlights

**Hash Functions:** Cryptographic hash functions like SHA-256 convert input data into fixed-length strings, ensuring immutability and preventing unauthorized alterations.



**Digital Signatures:** Public-key cryptography enables secure transaction signing and verification, ensuring authenticity and non-repudiation.



**Zero-Knowledge Proofs (ZKPs):** Advanced methods allowing verification of information without revealing the actual data, enhancing privacy in blockchain systems.

## Zero Knowledge Proofs



**Consensus Security:** Cryptography underpins protocols like Proof of Work (PoW) and Proof of Stake (PoS), making block validation reliable and resistant to manipulation. It ensures fair participation among nodes while preventing double-spending and majority attacks.

## Conclusion

Cryptography is the backbone of blockchain, ensuring secure, transparent, and immutable transactions. Without cryptographic methods, blockchain would lose its core strengths of decentralization and trustlessness.

## Future Scope

Future advancements in blockchain cryptography will focus on: Post-Quantum Cryptography to protect against quantum computing threats. Homomorphic Encryption enabling secure computations on encrypted data. Privacy-Preserving Protocols for enhanced confidentiality in financial and healthcare applications. Scalable Cryptographic Mechanisms to support faster and larger blockchain networks. As blockchain adoption continues to expand, cryptography will evolve to meet new challenges, ensuring security, scalability, and privacy in the decentralized digital future.

 **Sachin Bhosale, - Computer Technology**

| Academic Achievers (AY- 2024-2025) |                            |              |
|------------------------------------|----------------------------|--------------|
| Class: FY Computer Technology      |                            |              |
| S. N.                              | Student Name               | Percentage % |
| 1                                  | PAWAR PAYAL VIJAY          | 92.82        |
| 2                                  | JAMADADE VAISHNAVI KALIDAS | 92.59        |
| 3                                  | SHINDE PAYAL SANTOSH       | 92.00        |

| Class: SY Computer Technology |                             |              |
|-------------------------------|-----------------------------|--------------|
| S. N.                         | Student Name                | Percentage % |
| 1                             | MUDEGOANKAR ISHWARI JAGDISH | 95.65        |
| 2                             | PAWAR NAMRATA ARVIND        | 92.35        |
| 3                             | KHEDEKAR ISHWARI DHANANJAY  | 92.12        |

| Class: TY Computer Technology |                        |              |
|-------------------------------|------------------------|--------------|
| S. N.                         | Student Name           | Percentage % |
| 1                             | GHADAGE SAKSHI DHANAJI | 95.65        |
| 2                             | PAWAR SAKSHI VIJAY     | 95.41        |
| 3                             | PAWAR ARATI POPAT      | 95.06        |



We are pleased to announce that *Ms. Badodkar Swara Sarang* from the Academic Year 2024-2025 has been successfully placed in *Wipro Technologies Pvt. Ltd.*

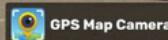
## Faculty Participation in MSBTE-Sponsored FDP

Our faculty members, Mr. Sachin Ghalame and Ms. Vrunda Kulkarni, successfully participated in the MSBTE-sponsored Faculty Development Program (FDP) on 'Emerging Trends in AI & Data Science: Hands-on Experience with Industry 5.0 Tools'. This FDP enriched their knowledge with cutting-edge advancements and practical insights, further strengthening our department's academic excellence.



## Bengaluru, Karnataka, India

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08/08/2025 12:22 PM GMT +05:30



Industrial Visit to U R Rao Satellite Centre, ISRO, Bengaluru  
Date: 8th August 2025  
Academic Year: 2025-26  
Computer Technology | 3rd Sem

### Our Students Admitted to Reputed Institutions for Higher Education AY - 2025-2026



Ghadage Sakshi Dhanaji  
(Walchand College of Engineering, Sangali)



Pawar Sakshi Vijay  
(Walchand College of Engineering, Sangali)



Kurulkar Arya Anan  
(Pune Institute of Computer Technology)



Pawar Arati Popat  
(Pune Institute of Computer Technology)



4th September 2025

Title - "Artificial Intelligence"  
Guest - Priyanka M. Pawar,  
Senior Technical Consultant,  
Capgemini India Pvt. Ltd.,  
Pune

#### Objectives

- Comprehensive Understanding: Provide students with a broad understanding of Artificial Intelligence (AI).
- Fundamentals & History: Introduce the basic concepts and evolution of AI.
- Emerging Trends: Explore current advancements and future directions in AI research.
- Interactive Learning: Encourage Q&A, discussions, and awareness of AI career opportunities.

#### Description

Conducting a lecture on Artificial Intelligence for diploma computer technology students is highly significant, as it is not part of their current curriculum. This initiative bridges the gap between academic learning and industry requirements. It introduces students to emerging trends and real-world AI applications. Priyanka M. Pawar shared her industrial experience and expertise in AI, providing valuable insights.

#### Key Takeaways for Students

- Gained a broader understanding of Artificial Intelligence.
- Learned how AI applications are solving real-world problems.
- Understood how to analyze real-world challenges where AI can be applied.



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124, Shelve, Maharashtra 413304, India  
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04/09/2025 01:49 PM GMT +05:30



### Upcoming Events

- Workshop on RPA - For Second Year (SY) Students
- Industrial Visit - For Third Year (TY) Students
- Guest Lecture - Topic : 'Machine Learning'



#### Our Pillars

- Shri. Rohan Paricharak, Chairman
- Dr. Ajit Kanase, Principal
- Shri. G. D. Walake, Registrar
- Karmayogi Management Team



#### Special Support:

1. Mohaseen Shaikh
2. Anil Kale
3. Vrunda Kulkarni
4. Prajakta Sugandhi
5. Sakshi Shivsharan
6. Shubham More
7. Vinod Gajare
8. Pravin Dhanwade
9. Sachin Bhosale