Date: 01.06.2

To,
Campus Director,
ICEEM
Aurangabad.

Subject: Proposal for Introducing a Course in "Advance in Blockchain technology" for BE EEE Students for the Academic Year 2022-23.

Respected Sir,

I am writing to propose the Introducing a Course in "Advance in Blockchain technology" for BE EEE Students for the Academic Year 2022-23.

This course provides an introduction to blockchain technology, covering its origins, underlying principles, and practical applications. Students will explore how blockchain works as a decentralized ledger and its potential to revolutionize industries beyond finance.

I believe that introducing this course will significantly benefit our students and enhance the academic standards of our EEE Department.

Thank you for considering my request. I am looking forward to your positive response.
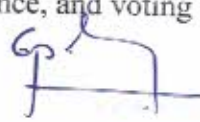
Yours sincerely,

Name :- Sayli Rathod.
Head of EEE Department
International Center for Excellence
in Engineering & Management

CAMPUS DIRECTOR
International Centre of
Excellence In Engg. & MGMT.
Aurangabad

Course Objectives:

- **Understand Blockchain Fundamentals:**

  - Define blockchain technology and its core components (blocks, transactions, cryptography).
  - Explain the decentralized nature of blockchain and its benefits compared to traditional centralized systems.

- **Explore Blockchain Architecture:**

  - Describe the structure of a blockchain: blocks, chains, nodes, and consensus mechanisms.
  - Differentiate between public, private, permissioned, and permissionless blockchains.

- **Learn Cryptographic Foundations for Blockchain:**

  - Understand basic cryptographic principles such as hash functions, digital signatures, and cryptographic hashing.
  - Analyze how cryptography ensures security, integrity, and immutability in blockchain transactions.

- **Examine Blockchain Consensus Mechanisms:**

  - Explore various consensus algorithms like Proof of Work (PoW), Proof of Stake (PoS), and Practical Byzantine Fault Tolerance (PBFT).
  - Evaluate the strengths, weaknesses, and applications of different consensus mechanisms in blockchain networks.

- **Introduction to Smart Contracts and Decentralized Applications (DApps):**

  - Define smart contracts and their role in automating processes on the blockchain.
  - Discuss platforms like Ethereum for developing smart contracts and decentralized applications (DApps).

- **Study Blockchain Use Cases Across Industries:**

  - Identify real-world applications of blockchain technology beyond cryptocurrencies.
  - Analyze use cases in sectors such as supply chain management, healthcare, finance, and voting systems.

- **Explore Blockchain Security:**

  - Assess security challenges in blockchain networks, including 51% attacks, double spending, and private key management.
  - Develop strategies and best practices for enhancing blockchain security and mitigating risks.

- **Discuss Regulatory and Ethical Considerations:**

  - Review the regulatory landscape and legal considerations surrounding blockchain technology globally.

- Address ethical issues related to data privacy, ownership, and governance in blockchain applications.

- **Explore Emerging Trends and Future Directions**:

  - Investigate advanced topics in blockchain technology, such as interoperability, scalability solutions (e.g., sharding), and integration with AI and IoT.
  - Discuss ongoing research and development in blockchain innovations and their potential impact on industries.

Course Outline:

- Definition of blockchain technology
- Historical background and evolution of blockchain
- Importance and potential impact of blockchain in various industries.
- Components of a blockchain: blocks, chains, nodes
- Smart contracts and their role in blockchain
- Understanding transactions and wallets

Benefits to Students:

These benefits illustrate how learning about blockchain technology can equip students with both technical skills and a broader understanding of its impact on society and industries.

- **Understanding Emerging Technology:** Students will grasp the foundational concepts of blockchain, a transformative technology poised to revolutionize various industries beyond finance, such as supply chain management, healthcare, and voting systems.

- **Career Opportunities:** Knowledge of blockchain opens doors to careers in blockchain development, smart contract programming, blockchain consulting, and blockchain architecture.

- **Enhanced Problem-Solving Skills:** Blockchain requires understanding complex decentralized systems and cryptographic principles, fostering critical thinking and problem-solving abilities.

- **Hands-on Experience:** Many courses include practical projects where students develop and deploy smart contracts, creating tangible skills and portfolio pieces.

- **Industry Relevance:** As blockchain adoption grows, understanding its applications and implications becomes increasingly valuable across industries, making students more attractive to employers.

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Aurangabad

- **Financial Literacy:** Studying blockchain introduces students to cryptocurrencies and digital assets, enhancing their financial literacy in the digital economy.

- **Global Perspective:** Blockchain operates on a global scale with implications for international finance and governance, providing students with insights into global economic trends and challenges.

- **Networking Opportunities:** Courses often include interactions with industry experts, networking events, or access to online communities focused on blockchain technology.

- **Ethical Considerations:** Understanding blockchain technology includes discussions on privacy, security, and ethical implications, preparing students to navigate these issues in their future careers.

- **Innovation and Entrepreneurship:** Students can explore entrepreneurial opportunities in blockchain startups or create innovative solutions leveraging blockchain technolog.

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Soft-skills Assisment

Multiple-Choice Questions (MCQs) Test Paper   (20 Marks)

Here are some more new multiple-choice questions (MCQs) for a "Basics of Blockchain Technology" course:

1. **Question:** What does "decentralization" refer to in the context of blockchain technology?
   - A) Having multiple copies of the blockchain on different servers
   - B) Allowing a single entity to control the entire network
   - C) Storing data in a centralized database
   - D) Distributing control and data across a network of nodes

   Answer: D) Distributing control and data across a network of nodes

2. **Question:** Which cryptographic technique is used to link each block in a blockchain to its predecessor?
   - A) Digital signatures
   - B) Public-key encryption
   - C) Hash functions
   - D) Symmetric encryption

   Answer: C) Hash functions

3. **Question:** What is the purpose of the nonce in the Proof of Work (PoW) consensus algorithm?
   - A) Encrypting transaction data
   - B) Verifying digital signatures
   - C) Finding a valid block hash
   - D) Adding security layers to smart contracts

   Answer: C) Finding a valid block hash

4. **Question:** Which type of blockchain allows multiple organizations to share control over the network?
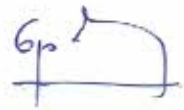   - A) Public blockchain
   - B) Private blockchain
   - C) Consortium blockchain
   - D) Permissioned blockchain

   Answer: C) Consortium blockchain

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5. **Question:** In blockchain terminology, what is a "fork"?
   - A) A transaction that fails to be included in a block
   - B) An upgrade or change to the blockchain protocol
   - C) A node that joins the network for the first time
   - D) A cryptographic key used to sign transactions

   Answer: B) An upgrade or change to the blockchain protocol

6. **Question:** What role do miners play in the blockchain network?
   - ○ A) Validating transactions and adding them to the blockchain
   - ○ B) Developing new blockchain protocols
   - ○ C) Executing smart contracts
   - ○ D) Providing network security through encryption

   Answer: A) Validating transactions and adding them to the blockchain

7. **Question:** Which blockchain platform is known for its focus on interoperability between different blockchains?
   - ○ A) Bitcoin
   - ○ B) Ethereum
   - ○ C) Polkadot
   - ○ D) Cardano

   Answer: C) Polkadot

8. **Question:** What does the term "consensus" refer to in a blockchain network?
   - ○ A) The total number of nodes in the network
   - ○ B) An agreement among nodes on the validity of transactions
   - ○ C) The process of securing private keys
   - ○ D) The time taken to mine a new block

   Answer: B) An agreement among nodes on the validity of transactions

9. **Question:** Which of the following is a potential challenge for blockchain adoption in industries like finance and healthcare?
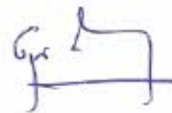   - ○ A) Limited scalability
   - ○ B) Low transaction security
   - ○ C) Lack of regulatory oversight
   - ○ D) Excessive energy consumption

   Answer: A) Limited scalability

10. **Question:** What regulatory concern is often associated with blockchain applications?
    - ○ A) Cross-border data transfer restrictions
    - ○ B) Blockchain encryption standards
    - ○ C) Blockchain mining regulations
    - ○ D) Smart contract deployment guidelines

    Answer: A) Cross-border data transfer restrictions

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Marking Scheme

Sr. No.	Assessment Component	Marks Allocation
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Kindly, consider it.

Thank you.

Campus Director

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Date: 01.07.28

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Aurangabad

Course Outline:

- Overview of blockchain technology
- History and evolution of blockchain
- Key characteristics: decentralization, transparency, immutability

Benefits to Students:

These benefits highlight how learning about blockchain technology can equip students with both technical skills and a broader understanding of its impact on society and industries, preparing them for future opportunities and challenges in the digital economy.

1. **Understanding a Transformative Technology**: Blockchain is a revolutionary technology with implications across various industries beyond finance, such as supply chain management, healthcare, and voting systems.
2. **Career Opportunities**: Knowledge of blockchain opens doors to careers in blockchain development, smart contract programming, blockchain consulting, and blockchain architecture.
3. **Enhanced Technical Skills**: Students gain practical skills in cryptography, decentralized systems, consensus algorithms, and smart contract development, enhancing their technical proficiency.
4. **Innovation and Entrepreneurship**: Learning blockchain encourages entrepreneurial thinking, allowing students to explore opportunities in blockchain startups or create innovative solutions leveraging blockchain technology.
5. **Financial Literacy**: Understanding blockchain introduces students to cryptocurrencies and digital assets, enhancing their financial literacy in the digital economy.
6. **Critical Thinking and Problem-Solving**: Blockchain requires understanding complex decentralized systems and cryptographic principles, fostering critical thinking and problem-solving abilities.
7. **Global Perspective**: Blockchain operates on a global scale with implications for international finance and governance, providing students with insights into global economic trends and challenges.
8. **Ethical Considerations**: Studying blockchain technology includes discussions on privacy, security, and ethical implications, preparing students to navigate these issues in their future careers.
9. **Networking Opportunities**: Courses often include interactions with industry experts, networking events, or access to online communities focused on blockchain technology.
10. **Industry Relevance**: As blockchain adoption grows, understanding its applications and implications becomes increasingly valuable across industries, making students more attractive to employers.

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Soft-skills Assisment

Multiple-Choice Questions (MCQs) Test Paper

(20 Marks)

Question: What is the main purpose of a blockchain network?

- A) Storing large amounts of data
- B) Facilitating centralized control
- C) Enabling secure and transparent transactions
- D) Performing real-time analytics

Answer: C) Enabling secure and transparent transactions

Question: In blockchain terminology, what is a "block"?

- A) A group of interconnected nodes
- B) A centralized database entry
- C) A collection of verified transactions
- D) A digital signature algorithm

Answer: C) A collection of verified transactions

Question: Which consensus mechanism requires participants to prove ownership of a certain amount of cryptocurrency in order to validate transactions?

- A) Proof of Work (PoW)
- B) Proof of Stake (PoS)
- C) Byzantine Fault Tolerance (BFT)
- D) Delegated Proof of Stake (DPoS)

Answer: B) Proof of Stake (PoS)

Question: What does "immutability" mean in the context of blockchain?

- A) The ability to edit transaction details
- B) Data stored on the blockchain cannot be altered
- C) Only authorized users can access blockchain data
- D) Blockchain transactions are anonymous

Answer: B) Data stored on the blockchain cannot be altered

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Question: Which type of blockchain restricts access to authorized participants only?

- A) Public blockchain
- B) Private blockchain

Course Objectives:

- **Introduction to Blockchain**: Provide a comprehensive understanding of what blockchain technology is, its origins, and its key components.

- **Fundamental Concepts**: Explain the core concepts of decentralization, immutability, transparency, and consensus mechanisms as they relate to blockchain.

- **Blockchain Architecture**: Describe the structure of a blockchain, including blocks, chains, nodes, and the role of cryptographic hash functions.

- **Types of Blockchains**: Differentiate between public, private, consortium, and permissioned blockchains, discussing their respective use cases and differences.

- **Cryptographic Foundations**: Introduce the cryptographic principles underpinning blockchain technology, including hashing, digital signatures, and cryptographic keys.

- **Smart Contracts**: Explore the concept of smart contracts, their functionality, and their role in automating business processes on blockchain platforms.

- **Use Cases and Applications**: Examine real-world applications of blockchain technology beyond cryptocurrencies, such as supply chain management, healthcare, and voting systems.

- **Blockchain Security**: Discuss security considerations in blockchain networks, including consensus algorithm vulnerabilities, 51% attacks, and best practices for securing digital assets.

- **Regulatory and Legal Aspects**: Investigate the regulatory landscape surrounding blockchain technology, including data privacy, compliance, and legal enforceability of smart contracts.

- **Future Trends and Innovations**: Explore emerging trends in blockchain technology, such as decentralized finance (DeFi), non-fungible tokens (NFTs), and scalability solutions.

- **Hands-on Experience**: Provide practical exercises or projects where students can apply blockchain concepts, such as setting up a simple blockchain network or writing and deploying a smart contract.

- **Critical Analysis**: Encourage critical thinking about the potential benefits, challenges, and ethical implications of blockchain technology in various industries and societal contexts.

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- C) Consortium blockchain
- D) Hybrid blockchain

Answer: B) Private blockchain

Question: What role do nodes play in a blockchain network?

- A) Executing smart contracts
- B) Mining new cryptocurrency
- C) Verifying and storing transactions
- D) Securing private keys

Answer: C) Verifying and storing transactions

Question: Which blockchain platform introduced the concept of smart contracts?

- A) Bitcoin
- B) Ethereum
- C) Ripple
- D) Litecoin

Answer: B) Ethereum

Question: What is the primary advantage of using smart contracts?

- A) Increased network scalability
- B) Greater transaction anonymity
- C) Automated execution of agreements
- D) Enhanced data encryption

Answer: C) Automated execution of agreements

Question: What is a potential drawback of blockchain technology in terms of scalability?

- A) Limited transaction speed
- B) High energy consumption
- C) Vulnerability to cyber attacks
- D) Difficulty in securing digital assets

Answer: A) Limited transaction speed

Question: Which legal issue poses a challenge for widespread blockchain adoption?

- A) Intellectual property rights
- B) Environmental regulations
- C) Cryptocurrency taxation
- D) Consumer protection laws

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Answer: C) Cryptocurrency taxation

Marking Scheme

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Kindly, consider it.

Thank you.

Campus Director

CAMPUS DIRECTOR
International Centre of
Excellence In Engg. & MGMT.
Aurangabad

Date: 01 07 22

To,
Campus Director,
ICEEM
Aurangabad.

Subject: Proposal for Introducing a Course in "Introduction of Blockchain Technology" for SE EEE
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ledger and its potential to revolutionize industries beyond finance.

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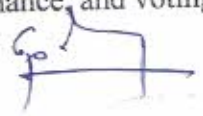Thank you for considering my request. I am looking forward to your positive response.
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International Center for Excellence
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Aurangabad

Course Objectives:

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  - Define smart contracts and their role in automating processes on the blockchain.
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- **Study Blockchain Use Cases Across Industries:**

  - Identify real-world applications of blockchain technology beyond cryptocurrencies.
  - Analyze use cases in sectors such as supply chain management, healthcare, finance, and voting systems.

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  - Assess security challenges in blockchain networks, including 51% attacks, double spending, and private key management.
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  - Review the regulatory landscape and legal considerations surrounding blockchain technology globally.

- Address ethical issues related to data privacy, ownership, and governance in blockchain applications.

- **Explore Emerging Trends and Future Directions**:

  - Investigate advanced topics in blockchain technology, such as interoperability, scalability solutions (e.g., sharding), and integration with AI and IoT.
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Course Outline:

- Definition of blockchain technology
- Historical background and evolution of blockchain
- Importance and potential impact of blockchain in various industries.
- Components of a blockchain: blocks, chains, nodes
- Smart contracts and their role in blockchain
- Understanding transactions and wallets

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Benefits to Students:

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- **Enhanced Problem-Solving Skills:** Blockchain requires understanding complex decentralized systems and cryptographic principles, fostering critical thinking and problem-solving abilities.

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ENGINEERING AND MANAGEMENT (ICEEM)
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Expanding Horizon

Soft-skills Assisment

Multiple-Choice Questions (MCQs) Test Paper　　　　(20 Marks)

- **Question:** What is a key feature of blockchain technology?

  - A) Centralized control
  - B) Immutability
  - C) Dynamic scaling
  - D) Transparent anonymity

  Answer: B) Immutability

- **Question:** Which cryptographic technique is commonly used in blockchain for ensuring data integrity?

  - A) RSA
  - B) AES
  - C) SHA-256
  - D) DES

  Answer: C) SHA-256

- **Question:** In blockchain terminology, what are 'nodes'?

  - A) Individual transactions
  - B) Cryptocurrency miners
  - C) Participants in the network
  - D) Smart contracts

  Answer: C) Participants in the network

Question: Which type of blockchain allows anyone to join the network, read transactions, and participate

in the consensus process?

  - A) Public blockchain
  - B) Private blockchain
  - C) Consortium blockchain
  - D) Permissioned blockchain
  - **Answer:** A) Public blockchain

Question: What role do miners play in the blockchain network?

  - A) Verifying transactions and adding them to the blockchain
  - B) Creating new cryptocurrencies
  - C) Securing private keys
  - D) Executing smart contracts

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Answer: A) Verifying transactions and adding them to the blockchain

Question: Which programming language is commonly used for writing smart contracts on the Ethereum blockchain?

- A) JavaScript
- B) Python
- C) Solidity
- D) C++

Answer: C) Solidity

Question: What is the primary benefit of using smart contracts on a blockchain?

- A) Enhanced privacy
- B) Increased transaction speed
- C) Automated execution of agreements
- D) Greater decentralization

Answer: C) Automated execution of agreements

Question: What is a major security concern in public blockchains?

- A) Double spending
- B) 51% attacks
- C) Smart contract bugs
- D) Private key theft

Answer: B) 51% attacks

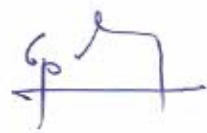**Question:** What regulatory challenge do blockchain applications often face?

- A) Taxation policies
- B) Data encryption laws
- C) Anti-money laundering (AML) compliance
- D) Cybersecurity standards

Answer: C) Anti-money laundering (AML) compliance

Question: Which trend is considered a promising application of blockchain technology beyond cryptocurrencies?

- A) Social media platforms
- B) Virtual reality gaming
- C) Decentralized finance (DeFi)
- D) Artificial intelligence (AI) algorithms

Answer: C) Decentralized finance (DeFi)

CAMPUS DIRECTOR
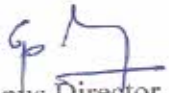International Centre of
Excellence In Engg. & MGMT.

Marking Scheme

Sr. No.	Assessment Component	Marks Allocation
1	Multiple-Choice Questions (MCQ)	20 marks
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Kindly, consider it.

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Campus Director

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Date: 06.07.21

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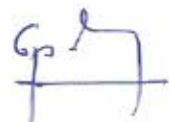
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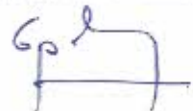- **Study Blockchain Use Cases Across Industries:**

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- **Career Opportunities:** Knowledge of blockchain opens doors to careers in blockchain development, smart contract programming, blockchain consulting, and blockchain architecture.

- **Enhanced Problem-Solving Skills:** Blockchain requires understanding complex decentralized systems and cryptographic principles, fostering critical thinking and problem-solving abilities.

- **Hands-on Experience:** Many courses include practical projects where students develop and deploy smart contracts, creating tangible skills and portfolio pieces.

- **Industry Relevance:** As blockchain adoption grows, understanding its applications and implications becomes increasingly valuable across industries, making students more attractive to employers.

- **Financial Literacy:** Studying blockchain introduces students to cryptocurrencies and digital assets, enhancing their financial literacy in the digital economy.

- **Global Perspective:** Blockchain operates on a global scale with implications for international finance and governance, providing students with insights into global economic trends and challenges.

- **Networking Opportunities:** Courses often include interactions with industry experts, networking events, or access to online communities focused on blockchain technology.

- **Ethical Considerations:** Understanding blockchain technology includes discussions on privacy, security, and ethical implications, preparing students to navigate these issues in their future careers.

- **Innovation and Entrepreneurship:** Students can explore entrepreneurial opportunities in blockchain startups or create innovative solutions leveraging blockchain technolog.

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Soft-skills Assisment

Multiple-Choice Questions (MCQs) Test Paper   (20 Marks)

Here are some more new multiple-choice questions (MCQs) for a "Basics of Blockchain Technology" course:

1. **Question:** What does "decentralization" refer to in the context of blockchain technology?
   - A) Having multiple copies of the blockchain on different servers
   - B) Allowing a single entity to control the entire network
   - C) Storing data in a centralized database
   - D) Distributing control and data across a network of nodes

   Answer: D) Distributing control and data across a network of nodes

2. **Question:** Which cryptographic technique is used to link each block in a blockchain to its predecessor?
   - A) Digital signatures
   - B) Public-key encryption
   - C) Hash functions
   - D) Symmetric encryption

   Answer: C) Hash functions

3. **Question:** What is the purpose of the nonce in the Proof of Work (PoW) consensus algorithm?
   - A) Encrypting transaction data
   - B) Verifying digital signatures
   - C) Finding a valid block hash
   - D) Adding security layers to smart contracts

   Answer: C) Finding a valid block hash

4. **Question:** Which type of blockchain allows multiple organizations to share control over the network?
   - A) Public blockchain
   - B) Private blockchain
   - C) Consortium blockchain
   - D) Permissioned blockchain

   Answer: C) Consortium blockchain

5. **Question:** In blockchain terminology, what is a "fork"?
   - A) A transaction that fails to be included in a block
   - B) An upgrade or change to the blockchain protocol
   - C) A node that joins the network for the first time
   - D) A cryptographic key used to sign transactions

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   Answer: B) An upgrade or change to the blockchain protocol

6. **Question:** What role do miners play in the blockchain network?
    - o A) Validating transactions and adding them to the blockchain
    - o B) Developing new blockchain protocols
    - o C) Executing smart contracts
    - o D) Providing network security through encryption

    Answer: A) Validating transactions and adding them to the blockchain

7. **Question:** Which blockchain platform is known for its focus on interoperability between different blockchains?
    - o A) Bitcoin
    - o B) Ethereum
    - o C) Polkadot
    - o D) Cardano

    Answer: C) Polkadot

8. **Question:** What does the term "consensus" refer to in a blockchain network?
    - o A) The total number of nodes in the network
    - o B) An agreement among nodes on the validity of transactions
    - o C) The process of securing private keys
    - o D) The time taken to mine a new block

    Answer: B) An agreement among nodes on the validity of transactions

9. **Question:** Which of the following is a potential challenge for blockchain adoption in industries like finance and healthcare?
    - o A) Limited scalability
    - o B) Low transaction security
    - o C) Lack of regulatory oversight
    - o D) Excessive energy consumption

    Answer: A) Limited scalability

10. **Question:** What regulatory concern is often associated with blockchain applications?
    - o A) Cross-border data transfer restrictions
    - o B) Blockchain encryption standards
    - o C) Blockchain mining regulations
    - o D) Smart contract deployment guidelines

    Answer: A) Cross-border data transfer restrictions

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Marking Scheme

Sr. No.	Assessment Component	Marks Allocation
1	Multiple-Choice Questions (MCQ)	20 marks
2	Total	20 marks

Kindly, consider it.

Thank you.

Campus Director

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Date:31/05/2023

To,
Campus Director,
ICEEM
Aurangabad.

Subject: Proposal for Introducing a Course in "Basics Blockchain technology" for TE EEE
         Students for the Academic Year 2021-22.

Respected Sir,

I am writing to propose the Introducing a Course in "Basics Blockchain technology" for TE EEE
Students for the Academic Year 2021-22.

This course provides an introduction to blockchain technology, covering its origins, underlying
principles, and practical applications. Students will explore how blockchain works as a decentralized
ledger and its potential to revolutionize industries beyond finance.

I believe that introducing this course will significantly benefit our students and enhance the academic
standards of our EEE Department.
Thank you for considering my request. I am looking forward to your positive response.
Yours sincerely,

Name :- Sayli Rathod.
Head of EEE Department
International Center for Excellence
in Engineering & Management

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Course Objectives:

- **Introduction to Blockchain**: Provide a comprehensive understanding of what blockchain technology is, its origins, and its key components.

- **Fundamental Concepts**: Explain the core concepts of decentralization, immutability, transparency, and consensus mechanisms as they relate to blockchain.

- **Blockchain Architecture**: Describe the structure of a blockchain, including blocks, chains, nodes, and the role of cryptographic hash functions.

- **Types of Blockchains**: Differentiate between public, private, consortium, and permissioned blockchains, discussing their respective use cases and differences.

- **Cryptographic Foundations**: Introduce the cryptographic principles underpinning blockchain technology, including hashing, digital signatures, and cryptographic keys.

- **Smart Contracts**: Explore the concept of smart contracts, their functionality, and their role in automating business processes on blockchain platforms.

- **Use Cases and Applications**: Examine real-world applications of blockchain technology beyond cryptocurrencies, such as supply chain management, healthcare, and voting systems.

- **Blockchain Security**: Discuss security considerations in blockchain networks, including consensus algorithm vulnerabilities, 51% attacks, and best practices for securing digital assets.

- **Regulatory and Legal Aspects**: Investigate the regulatory landscape surrounding blockchain technology, including data privacy, compliance, and legal enforceability of smart contracts.

- **Future Trends and Innovations**: Explore emerging trends in blockchain technology, such as decentralized finance (DeFi), non-fungible tokens (NFTs), and scalability solutions.

- **Hands-on Experience**: Provide practical exercises or projects where students can apply blockchain concepts, such as setting up a simple blockchain network or writing and deploying a smart contract.

- **Critical Analysis**: Encourage critical thinking about the potential benefits, challenges, and ethical implications of blockchain technology in various industries and societal contexts.

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Course Outline:

- Overview of blockchain technology
- History and evolution of blockchain
- Key characteristics: decentralization, transparency, immutability

Benefits to Students:

These benefits highlight how learning about blockchain technology can equip students with both technical skills and a broader understanding of its impact on society and industries, preparing them for future opportunities and challenges in the digital economy.

1. **Understanding a Transformative Technology**: Blockchain is a revolutionary technology with implications across various industries beyond finance, such as supply chain management, healthcare, and voting systems.
2. **Career Opportunities**: Knowledge of blockchain opens doors to careers in blockchain development, smart contract programming, blockchain consulting, and blockchain architecture.
3. **Enhanced Technical Skills**: Students gain practical skills in cryptography, decentralized systems, consensus algorithms, and smart contract development, enhancing their technical proficiency.
4. **Innovation and Entrepreneurship**: Learning blockchain encourages entrepreneurial thinking, allowing students to explore opportunities in blockchain startups or create innovative solutions leveraging blockchain technology.
5. **Financial Literacy**: Understanding blockchain introduces students to cryptocurrencies and digital assets, enhancing their financial literacy in the digital economy.
6. **Critical Thinking and Problem-Solving**: Blockchain requires understanding complex decentralized systems and cryptographic principles, fostering critical thinking and problem-solving abilities.
7. **Global Perspective**: Blockchain operates on a global scale with implications for international finance and governance, providing students with insights into global economic trends and challenges.
8. **Ethical Considerations**: Studying blockchain technology includes discussions on privacy, security, and ethical implications, preparing students to navigate these issues in their future careers.
9. **Networking Opportunities**: Courses often include interactions with industry experts, networking events, or access to online communities focused on blockchain technology.
10. **Industry Relevance**: As blockchain adoption grows, understanding its applications and implications becomes increasingly valuable across industries, making students more attractive to employers.

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Soft-skills Assisment

Multiple-Choice Questions (MCQs) Test Paper

(20 Marks)

Question: What is the main purpose of a blockchain network?

- A) Storing large amounts of data
- B) Facilitating centralized control
- C) Enabling secure and transparent transactions
- D) Performing real-time analytics

Answer: C) Enabling secure and transparent transactions

Question: In blockchain terminology, what is a "block"?

- A) A group of interconnected nodes
- B) A centralized database entry
- C) A collection of verified transactions
- D) A digital signature algorithm

Answer: C) A collection of verified transactions

Question: Which consensus mechanism requires participants to prove ownership of a certain amount of cryptocurrency in order to validate transactions?

- A) Proof of Work (PoW)
- B) Proof of Stake (PoS)
- C) Byzantine Fault Tolerance (BFT)
- D) Delegated Proof of Stake (DPoS)

Answer: B) Proof of Stake (PoS)

Question: What does "immutability" mean in the context of blockchain?

- A) The ability to edit transaction details
- B) Data stored on the blockchain cannot be altered
- C) Only authorized users can access blockchain data
- D) Blockchain transactions are anonymous

Answer: B) Data stored on the blockchain cannot be altered

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Question: Which type of blockchain restricts access to authorized participants only?

- A) Public blockchain
- B) Private blockchain

- C) Consortium blockchain
- D) Hybrid blockchain

Answer: B) Private blockchain

Question: What role do nodes play in a blockchain network?

- A) Executing smart contracts
- B) Mining new cryptocurrency
- C) Verifying and storing transactions
- D) Securing private keys

Answer: C) Verifying and storing transactions

Question: Which blockchain platform introduced the concept of smart contracts?

- A) Bitcoin
- B) Ethereum
- C) Ripple
- D) Litecoin

Answer: B) Ethereum

Question: What is the primary advantage of using smart contracts?

- A) Increased network scalability
- B) Greater transaction anonymity
- C) Automated execution of agreements
- D) Enhanced data encryption

Answer: C) Automated execution of agreements

Question: What is a potential drawback of blockchain technology in terms of scalability?

- A) Limited transaction speed
- B) High energy consumption
- C) Vulnerability to cyber attacks
- D) Difficulty in securing digital assets

Answer: A) Limited transaction speed

Question: Which legal issue poses a challenge for widespread blockchain adoption?

- A) Intellectual property rights
- B) Environmental regulations
- C) Cryptocurrency taxation
- D) Consumer protection laws

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Answer: C) Cryptocurrency taxation

Marking Scheme

Sr. No.	Assessment Component	Marks Allocation
1	Multiple-Choice Questions (MCQ)	20 marks
2	Total	**20 marks**

Kindly, consider it.

Thank you.

Campus Director

Date: 03.07.21

To,
Campus Director,
ICEEM
Aurangabad.

Subject: Proposal for Introducing a Course in "Introduction of Blockchain Technology" for SE EEE Students for the Academic Year 2021-22.

Respected Sir,

I am writing to propose the Introducing a Course in "Introduction of Blockchain Technology" for SE EEE Students for the Academic Year 2021-22.

This course provides an introduction to blockchain technology, covering its origins, underlying principles, and practical applications. Students will explore how blockchain works as a decentralized ledger and its potential to revolutionize industries beyond finance.

I believe that introducing this course will significantly benefit our students and enhance the academic standards of our EEE Department.

Thank you for considering my request. I am looking forward to your positive response.
Yours sincerely,

Name :- Sayli Rathod.
Head of EEE Department
International Center for Excellence
in Engineering & Management

CAMPUS DIRECTOR
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Excellence In Engg. & MGMT.
Aurangabad

Course Objectives:

- ### Understand Blockchain Fundamentals:

  - Define blockchain technology and its core components (blocks, transactions, cryptography).
  - Explain the decentralized nature of blockchain and its benefits compared to traditional centralized systems.

- ### Explore Blockchain Architecture:

  - Describe the structure of a blockchain: blocks, chains, nodes, and consensus mechanisms.
  - Differentiate between public, private, permissioned, and permissionless blockchains.

- ### Learn Cryptographic Foundations for Blockchain:

  - Understand basic cryptographic principles such as hash functions, digital signatures, and cryptographic hashing.
  - Analyze how cryptography ensures security, integrity, and immutability in blockchain transactions.

- ### Examine Blockchain Consensus Mechanisms:

  - Explore various consensus algorithms like Proof of Work (PoW), Proof of Stake (PoS), and Practical Byzantine Fault Tolerance (PBFT).
  - Evaluate the strengths, weaknesses, and applications of different consensus mechanisms in blockchain networks.

- ### Introduction to Smart Contracts and Decentralized Applications (DApps):

  - Define smart contracts and their role in automating processes on the blockchain.
  - Discuss platforms like Ethereum for developing smart contracts and decentralized applications (DApps).

- ### Study Blockchain Use Cases Across Industries:

  - Identify real-world applications of blockchain technology beyond cryptocurrencies.
  - Analyze use cases in sectors such as supply chain management, healthcare, finance, and voting systems.

- ### Explore Blockchain Security:

  - Assess security challenges in blockchain networks, including 51% attacks, double spending, and private key management.
  - Develop strategies and best practices for enhancing blockchain security and mitigating risks.

- ### Discuss Regulatory and Ethical Considerations:

  - Review the regulatory landscape and legal considerations surrounding blockchain technology globally.

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- Address ethical issues related to data privacy, ownership, and governance in blockchain applications.

- **Explore Emerging Trends and Future Directions**:

  - Investigate advanced topics in blockchain technology, such as interoperability, scalability solutions (e.g., sharding), and integration with AI and IoT.
  - Discuss ongoing research and development in blockchain innovations and their potential impact on industries.

Course Outline:

- Definition of blockchain technology
- Historical background and evolution of blockchain
- Importance and potential impact of blockchain in various industries.
- Components of a blockchain: blocks, chains, nodes
- Smart contracts and their role in blockchain
- Understanding transactions and wallets

Benefits to Students:

These benefits illustrate how learning about blockchain technology can equip students with both technical skills and a broader understanding of its impact on society and industries.

- **Understanding Emerging Technology:** Students will grasp the foundational concepts of blockchain, a transformative technology poised to revolutionize various industries beyond finance, such as supply chain management, healthcare, and voting systems.

- **Career Opportunities:** Knowledge of blockchain opens doors to careers in blockchain development, smart contract programming, blockchain consulting, and blockchain architecture.

- **Enhanced Problem-Solving Skills:** Blockchain requires understanding complex decentralized systems and cryptographic principles, fostering critical thinking and problem-solving abilities.

- **Hands-on Experience:** Many courses include practical projects where students develop and deploy smart contracts, creating tangible skills and portfolio pieces.

- **Industry Relevance:** As blockchain adoption grows, understanding its applications and implications becomes increasingly valuable across industries, making students more attractive to employers.

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- **Financial Literacy:** Studying blockchain introduces students to cryptocurrencies and digital assets, enhancing their financial literacy in the digital economy.

- **Global Perspective:** Blockchain operates on a global scale with implications for international finance and governance, providing students with insights into global economic trends and challenges.

• **Networking Opportunities:** Courses often include interactions with industry experts, networking events, or access to online communities focused on blockchain technology.

• **Ethical Considerations:** Understanding blockchain technology includes discussions on privacy, security, and ethical implications, preparing students to navigate these issues in their future careers.

• **Innovation and Entrepreneurship:** Students can explore entrepreneurial opportunities in blockchain startups or create innovative solutions leveraging blockchain technolog.

Soft-skills Assisment

Multiple-Choice Questions (MCQs) Test Paper   **(20 Marks)**

• **Question:** What is a key feature of blockchain technology?

- A) Centralized control
- B) Immutability
- C) Dynamic scaling
- D) Transparent anonymity

Answer: B) Immutability

• **Question:** Which cryptographic technique is commonly used in blockchain for ensuring data integrity?

- A) RSA
- B) AES
- C) SHA-256
- D) DES

Answer: C) SHA-256

• **Question:** In blockchain terminology, what are 'nodes'?

- A) Individual transactions
- B) Cryptocurrency miners
- C) Participants in the network
- D) Smart contracts

Answer: C) Participants in the network

Question: Which type of blockchain allows anyone to join the network, read transactions, and participate in the consensus process?

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- A) Public blockchain
- B) Private blockchain
- C) Consortium blockchain
- D) Permissioned blockchain
- **Answer:** A) Public blockchain

Question: What role do miners play in the blockchain network?

- A) Verifying transactions and adding them to the blockchain
- B) Creating new cryptocurrencies
- C) Securing private keys
- D) Executing smart contracts

Answer: A) Verifying transactions and adding them to the blockchain

Question: Which programming language is commonly used for writing smart contracts on the Ethereum blockchain?

- A) JavaScript
- B) Python
- C) Solidity
- D) C++

Answer: C) Solidity

Question: What is the primary benefit of using smart contracts on a blockchain?

- A) Enhanced privacy
- B) Increased transaction speed
- C) Automated execution of agreements
- D) Greater decentralization

Answer: C) Automated execution of agreements

Question: What is a major security concern in public blockchains?

- A) Double spending
- B) 51% attacks
- C) Smart contract bugs
- D) Private key theft

Answer: B) 51% attacks

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Question: What regulatory challenge do blockchain applications often face?

- A) Taxation policies
- B) Data encryption laws
- C) Anti-money laundering (AML) compliance

- D) Cybersecurity standards

Answer: C) Anti-money laundering (AML) compliance

Question: Which trend is considered a promising application of blockchain technology beyond cryptocurrencies?

- A) Social media platforms
- B) Virtual reality gaming
- C) Decentralized finance (DeFi)
- D) Artificial intelligence (AI) algorithms

Answer: C) Decentralized finance (DeFi)

Marking Scheme

Sr. No.	Assessment Component	Marks Allocation
1	Multiple-Choice Questions (MCQ)	20 marks
2	Total	**20 marks**

Kindly, consider it.

Thank you.

Campus Director

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International Centre of Excellence in Engineering and Management

ICEEM Gut No.4, Opposite Bajaj Auto Ltd, Aurangabad-Pune Highway, Aurangabad 431136. (M.S.)

Tel.: 0240-2558101-10, Fax: 0240-2558111: E-mail: director@iceemabad.com, Website: www.iceemabad.com

Date: 08.08.19

To,
Campus Director,
ICEEM
Aurangabad.

Subject: Proposal for Introducing a Course in 'Advance Robotic technology" for BE E&TC Students for the Academic Year 2019-20

Respected Sir,

I am writing to propose the Introducing a Course in 'Introduction to Robotic Technology" for SE E&TC Students for the Academic Year 2019-20.

Advanced Robotic Technology involves the design and development of highly sophisticated robotic systems capable of performing complex tasks with precision and efficiency. These systems often integrate advanced sensors, actuators, and controllers to achieve superior levels of functionality and autonomy.

I believe that introducing this course will significantly benefit our students and enhance the academic standards of our EEE Department.

Thank you for considering my request. I am looking forward to your positive response.

Yours sincerely,

Name :- H. L Jadhav
Head of E&TC Department
International Center for Excellence
in Engineering & Management

CAMPUS DIRECTOR
International Centre of
Excellence In Engg. & MGMT.
Aurangabad

International Centre of Excellence in Engineering and Management

Gut No.4, Opposite Bajaj Auto Ltd, Aurangabad-Pune Highway, Aurangabad 431136. (M.S.)

Tel.: 0240-2558101-10, Fax: 0240-2558111; E-mail: director@iceemabad.com, Website: www.iceemabad.com

Course Objectives:

- **Advanced Robotic Systems Understanding:**

  - Develop a comprehensive understanding of advanced robotic systems, including their components, architecture, and integration of cutting-edge technologies.
  - Explore the principles behind complex robotic functionalities and their applications in diverse industries.

- **Integration of Artificial Intelligence (AI) in Robotics:**

  - Examine the role of AI and machine learning in enhancing robotic capabilities such as decision-making, learning from data, and adapting to dynamic environments.
  - Understand AI techniques relevant to robotics, including reinforcement learning, neural networks, and computer vision.

- **Advanced Sensing and Perception:**

  - Investigate advanced sensing technologies used in robotics, such as 3D vision, lidar, radar, and tactile sensing.
  - Explore perception algorithms for real-time environment mapping, object recognition, and navigation in complex scenarios.

- **Autonomous Navigation and Mobility:**

  - Analyze algorithms and techniques for autonomous navigation and path planning in unstructured and dynamic environments.
  - Evaluate sensor fusion methods and localization techniques critical for robust autonomous operation of robots.

- **Human-Robot Interaction and Collaboration:**

  - Study methodologies for safe and effective human-robot collaboration, including collaborative robotics (cobots) and shared autonomy.
  - Address challenges in designing interfaces and behaviors that promote intuitive interaction between humans and robots.

- **Advanced Manipulation and Dexterous Hands:**

  - Examine advanced manipulation capabilities, including the design of dexterous hands and grippers for delicate and precise object handling.
  - Explore control strategies and tactile feedback mechanisms that enhance the manipulation capabilities of robots.

- **Swarm Robotics and Multi-Robot Systems:**

  - Investigate swarm robotics principles and algorithms for coordinating multiple robots to achieve collective behaviors.

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Gut No.4, Opposite Bajaj Auto Ltd, Aurangabad-Pune Highway, Aurangabad 431136. (M.S.)
Tel.: 0240-2558101-10, Fax: 0240-2558111: E-mail: director@iceemabad.com, **Website:** www.iceemabad.com

- Explore applications of swarm intelligence in areas such as exploration, surveillance, and disaster response.

- **Ethical and Societal Implications of Robotics:**

  - Discuss ethical considerations related to the use of advanced robotic technologies, including privacy, job displacement, safety, and autonomy.
  - Analyze regulatory frameworks and guidelines governing the deployment of robotic systems in various industries.

- **Industry Applications and Case Studies:**

  - Explore real-world applications of advanced robotics across industries such as manufacturing, healthcare, space exploration, and agriculture.
  - Analyze case studies highlighting successful implementations, challenges faced, and lessons learned in deploying advanced robotic technologies.

- **Emerging Trends and Future Directions:**

  - Identify emerging trends in advanced robotics technology, including soft robotics, bio-inspired designs, and the integration of robotics with AI and IoT.
  - Discuss research directions and potential innovations shaping the future of robotics technology in addressing global challenges

Course outline :

- Overview of advanced robotic technologies: history, current trends, and future prospects.
- Interdisciplinary aspects: integration of mechanical, electrical, and AI engineering principles in advanced robotics.
- Components and architecture of advanced robotic systems.
- Case studies of state-of-the-art robotic platforms and their applications.

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Benefits to Students:

Advanced Robotic Technology offers several significant benefits to students, preparing them for a dynamic and evolving field that intersects with numerous industries and technological advancements. Here are some key benefits that students can derive from studying Advanced Robotic Technology:

1. **In-Depth Understanding of Cutting-Edge Technology:**
   - Students gain a comprehensive understanding of the latest advancements in robotic systems, including AI integration, advanced sensors, autonomous navigation, and collaborative robotics. This knowledge prepares them to work with state-of-the-art technologies shaping the future of robotics.

2. **Hands-On Experience and Practical Skills Development:**
   - Through hands-on projects, labs, and simulations, students develop practical skills in designing, programming, and operating advanced robotic systems. This hands-on experience enhances their technical proficiency and problem-solving abilities in real-world scenarios.

3. **Preparation for High-Demand Careers:**
   - The skills acquired in Advanced Robotic Technology are highly sought after in industries such as manufacturing, healthcare, aerospace, and logistics. Graduates are prepared for careers as robotics engineers, AI specialists, automation engineers, and researchers in academia or industry.

4. **Interdisciplinary Learning Opportunities:**
   - Robotics technology integrates principles from mechanical engineering, electrical engineering, computer science, and AI. Students engage in interdisciplinary learning, fostering a holistic approach to solving complex engineering challenges and developing innovative solutions.

5. **Exploration of Ethical and Societal Implications:**
   - The course addresses ethical considerations related to robotics, such as privacy, safety, job displacement, and the ethical use of AI. Students develop a critical awareness of these issues and learn to navigate ethical dilemmas in their future careers.

6. **Innovation and Research Opportunities:**
   - Advanced Robotic Technology encourages innovation through research projects and case studies. Students have opportunities to explore emerging trends, conduct experiments, and contribute to advancements in robotics through novel solutions and discoveries.

7. **Adaptability and Future-Proof Skills:**
   - Robotics is a rapidly evolving field with continuous advancements in technology and applications. Studying Advanced Robotic Technology equips students with adaptable skills and knowledge that are relevant across various industries and future-proof against technological shifts.

8. **Global Collaboration and Networking:**
   - As robotics technology is global in scope, students may collaborate with peers, researchers, and industry professionals worldwide. This global perspective enhances their understanding of diverse perspectives and promotes international collaboration on technological innovations.

9. **Personal and Professional Growth:**
   - Beyond technical skills, studying Advanced Robotic Technology fosters personal growth by cultivating teamwork, communication skills, and leadership qualities essential for success in multidisciplinary environments and collaborative projects.

10. **Contribution to Societal Impact:**

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Tel.: 0240-2558101-10, Fax: 0240-2558111: E-mail: director@iceemabad.com, **Website: www.iceemabad.com**

- o Robotics technology has the potential to address societal challenges through applications in healthcare, assistive technologies, environmental monitoring, disaster response, and more. Students can contribute to positive societal impact by applying their knowledge to create solutions that improve quality of life globally.

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Soft-skills Assisment

Multiple-Choice Questions (MCQs) Test Paper   **(20 Marks)**

Question 1: What is the primary role of artificial intelligence (AI) in advanced robotics?

- A) Controlling robot power supply
- B) Enhancing robot manipulation skills
- C) Enabling autonomous decision-making
- D) Improving robot communication

Answer: C) Enabling autonomous decision-making

Question 2: Which sensor is commonly used in robotics for precise distance measurement and navigation in unknown environments?

- A) Camera
- B) Lidar
- C) Ultrasonic sensor
- D) GPS receiver

Answer: B) Lidar

Question 3: What distinguishes collaborative robots (cobots) from traditional industrial robots?

- A) They are smaller in size
- B) They do not require programming
- C) They can work autonomously
- D) They can safely work alongside humans

Answer: D) They can safely work alongside humans

Question 4: In advanced robotics, what does SLAM stand for?

- A) Simultaneous Localization and Mapping
- B) Sensor Level Augmented Mapping
- C) Software Linked Adjustment Mechanism
- D) Systematic Location and Adjustment Method

Answer: A) Simultaneous Localization and Mapping

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Question 5: Which technology is used in advanced robotics to simulate human touch and enable robots to handle delicate objects?

- A) Tactile sensors
- B) Infrared sensors
- C) Accelerometers
- D) Proximity sensors

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Answer: A) Tactile sensors

Question 6: What is the main advantage of swarm robotics in complex tasks?

- A) Individual robots are simpler to program
- B) Collective behavior can achieve complex tasks more efficiently
- C) Robots can work independently without coordination
- D) Fewer robots are required for the task

Answer: B) Collective behavior can achieve complex tasks more efficiently

Question 7: What ethical concern is commonly associated with the deployment of advanced robotics in industries?

- A) Energy efficiency
- B) Job displacement
- C) Hardware cost
- D) Software compatibility

Answer: B) Job displacement

Question 8: Which industry commonly uses exoskeletons and wearable robotics powered by advanced technologies?

- A) Agriculture
- B) Entertainment
- C) Healthcare
- D) Retail

Answer: C) Healthcare

Question 9: What role does computer vision play in advanced robotics?

- A) Controlling robot motion
- B) Processing human commands
- C) Analyzing visual data for navigation and object recognition
- D) Monitoring environmental conditions

Answer: C) Analyzing visual data for navigation and object recognition

Question 10: Which programming language is commonly used for developing applications in Robot Operating System (ROS)?

- A) Java
- B) C++

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- C) Ruby
- D) PHP

Answer: B) C++

Marking Scheme

Sr. No.	Assessment Component	Marks Allocation
1	Multiple-Choice Questions (MCQ)	20 marks
2	Total	**20 marks**

Kindly, consider it.

Thank you.

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Date: 08.08.19

To,
Campus Director,
ICEEM
Aurangabad.

Subject: Proposal for Introducing a Course in 'Basics of Robotics technology" for TE E&TC Students for the Academic Year 2019-20.

Respected Sir,

I am writing to propose the Introducing a Course in 'Basics of Robotics technology" for TE E&TC Students for the Academic Year 2018-19.

The basics of robotics technology introduce learners to the interdisciplinary field that combines mechanical engineering, electrical engineering, computer science, and artificial intelligence. It explores the design, construction, operation, and use of robots, emphasizing their applications across various industries and everyday life.

I believe that introducing this course will significantly benefit our students and enhance the academic standards of our EEE Department.
Thank you for considering my request. I am looking forward to your positive response.
Yours sincerely,

Name :- H. L Jadhav
Head of E&TC Department
International Center for Excellence
in Engineering & Management

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Course Objectives:

- • **Introduction to Robotics Fundamentals:**

  - Provide an introduction to the basic principles, history, and evolution of robotics.
  - Explain the interdisciplinary nature of robotics, combining mechanical, electrical, and software engineering principles.

- **Understanding Robot Components:**

  - Describe the function and role of key components such as actuators, sensors, controllers, and end-effectors in robotic systems.
  - Illustrate how these components interact to enable robots to perform tasks autonomously or semi-autonomously.

- **Types and Applications of Robots:**

  - Classify different types of robots including industrial robots, service robots, autonomous vehicles, and drones.
  - Explore the applications of robots in industries such as manufacturing, healthcare, agriculture, exploration, and entertainment.

- **Programming and Control:**

  - Introduce programming languages and platforms used in robotics such as Python, C++, and Robot Operating System (ROS).
  - Teach basic programming skills for controlling robot motion, executing tasks, and integrating sensor feedback.
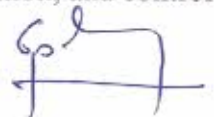
- **Robot Kinematics and Dynamics:**

  - Explain the concepts of robot kinematics (forward and inverse) and dynamics (forces, torques).
  - Discuss how kinematic and dynamic models are used for motion planning, simulation, and control of robotic systems.
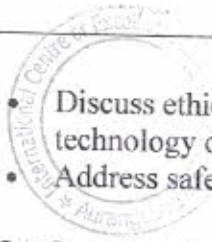
- **Sensors and Perception:**

  - Explore the role of sensors (e.g., vision sensors, proximity sensors, IMUs) in enabling robots to perceive and interact with their environment.
  - Cover perception algorithms for tasks such as object recognition, localization, and mapping.

- **Robotics Ethics and Safety:**

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- Discuss ethical considerations related to the design, deployment, and impact of robotics technology on society.
- Address safety standards, regulations, and best practices in robotic system design and operation.

- **Hands-on Projects and Lab Exercises:**

  - Engage students in practical exercises, labs, or projects to apply theoretical concepts in designing and programming robotic systems.
  - Foster teamwork, problem-solving skills, and creativity through collaborative projects and real-world simulations.

- **Emerging Trends and Innovations:**

  - Explore current trends and future directions in robotics technology, such as AI-driven robotics, collaborative robotics, and bio-inspired robotics.
  - Discuss the potential impact of emerging technologies on industries and society.

- **Career Preparation and Professional Development:**

  - Provide guidance on career paths in robotics, including further education opportunities and industry certifications.
  - Offer resources and networking opportunities to help students prepare for internships, job placements, and professional growth in the field of robotics.

Course outline :

- Overview of robotics: history, evolution, and current trends.
- Classification of robots: industrial, mobile, humanoid, etc.
- Ethical considerations in robotics.
- Sensors and actuators: types, functions, and applications.
- Controllers and microcontrollers in robotics.
- Introduction to Robot Operating System (ROS).

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Benefits to Students:

The course "Introduction to Robotic Technology" offers several benefits to students, equipping them with valuable knowledge and skills that can be applied across various disciplines and industries. Here are some key benefits:

- **Foundation in Robotics**: Students gain a solid understanding of the foundational principles and components of robotic systems. This includes knowledge of sensors, actuators, control systems, and their integration within robotic platforms.

- **Practical Skills Development**: The course typically involves hands-on experience through labs, projects, or simulations. This allows students to apply theoretical knowledge in real-world scenarios, enhancing their skills in robot assembly, programming, and operation.

- **Interdisciplinary Knowledge**: Robotics intersects with various disciplines such as mechanical engineering, electrical engineering, computer science, and artificial intelligence. Students benefit from exposure to these interdisciplinary connections, which broadens their understanding and prepares them for collaborative work in diverse settings.

- **Problem-solving Abilities**: Robotics involves complex challenges that require analytical thinking and problem-solving skills. Students learn to identify issues, analyze them systematically, and implement effective solutions, which are valuable skills across many industries.

- **Career Opportunities**: With the increasing automation and technological advancements in robotics, there is a growing demand for skilled professionals in fields such as industrial automation, autonomous vehicles, medical robotics, and more. This course equips students with the knowledge and skills sought after by employers in these sectors.

- **Innovation and Creativity**: Robotics is at the forefront of technological innovation. Studying robotic technology encourages creativity in designing new solutions and applications, fostering innovation among students.

- **Ethical and Social Awareness**: Robotics raises important ethical considerations regarding automation, job displacement, privacy, and safety. By exploring these issues, students develop a thoughtful approach to the societal impacts of technology, preparing them to contribute responsibly to the field.

- **Preparation for Advanced Studies**: For students considering further education in robotics, engineering, or related fields, this course provides a strong foundation. It prepares them for more advanced coursework and research in specialized areas of robotics.

- **Global Relevance**: Robotics is a global industry with applications and opportunities worldwide. Students gain skills that are transferable across borders, enhancing their competitiveness in the global job market.

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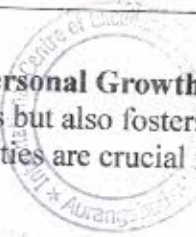International Centre of
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- **Personal Growth and Future-readiness**: Studying robotic technology not only enhances technical skills but also fosters personal growth in areas such as teamwork, communication, and adaptability. These qualities are crucial for success in any career path.

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Soft-skills Assisment

Multiple-Choice Questions (MCQs) Test Paper   (20 Marks)

Question 1: What is the primary function of actuators in a robotic system?

- A) To sense the environment
- B) To control robot motion
- C) To process data
- D) To provide power supply

Answer: B) To control robot motion

Question 2: Which programming language is commonly used for controlling robots in a Robot Operating System (ROS) environment?

- A) Java
- B) Python
- C) C#
- D) MATLAB

Answer: B) Python

Question 3: What is the term for the study of robot motion and positioning?

- A) Robotics kinematics
- B) Robotics dynamics
- C) Robotics perception
- D) Robotics control

Answer: A) Robotics kinematics

Question 4: Which sensor is commonly used in robotics for detecting distances to nearby objects?

- A) Lidar
- B) Infrared sensor
- C) Camera
- D) GPS

Answer: B) Infrared sensor

Question 5: What is the function of an end-effector in a robotic arm?

- A) To provide power supply
- B) To sense the environment

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- C) To manipulate objects
- D) To process data

Answer: C) To manipulate objects

Question 6: Which type of robot is designed to work alongside humans in a shared workspace?

- A) Industrial robot
- B) Mobile robot
- C) Humanoid robot
- D) Collaborative robot (cobot)

Answer: D) Collaborative robot (cobot)

Question 7: What does the acronym "IMU" stand for in the context of robotics?

- A) Internal Motion Unit
- B) Inertial Measurement Unit
- C) Image Mapping Unit
- D) Intelligent Motion Unit

Answer: B) Inertial Measurement Unit

Question 8: In robotics, what is the purpose of the Robot Operating System (ROS)?
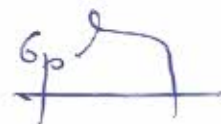
- A) To provide a physical platform for robots
- B) To simulate robot behaviors
- C) To provide middleware for robot control and coordination
- D) To program robot behaviors using natural language

Answer: C) To provide middleware for robot control and coordination

Question 9: Which industry commonly uses robots for tasks such as welding, assembly, and material handling?

- A) Agriculture
- B) Healthcare
- C) Automotive
- D) Education

Answer: C) Automotive

Question 10: What ethical concern is commonly associated with the advancement of robotics technology?

- A) Energy efficiency
- B) Job displacement
- C) Cost-effectiveness

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- D) Innovation in manufacturing

Answer: B) Job displacement

Marking Scheme

Sr. No.	Assessment Component	Marks Allocation
1	Multiple-Choice Questions (MCQ)	20 marks
2	Total	**20 marks**

Kindly, consider it.

Thank you.
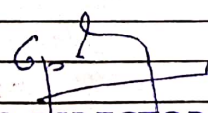
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Certificate Course Distribution Record EEE. Year:-2018-2019

Course Name:- S.E Introduction to Robotic Technology

Course Name:- T.E Basics of Robotic Technology

Course Name:- B.E Advance Robotic Technology

Sr.No	Name of the Student's	Signature
1	LOKHANDE DIPALI MAHESH	
2	DHANDE PALLAVI PRAKASH	
3	JADHAV SWAPNIL SHIVRAM	
4	GAIKWAD AJAY RAJENDRA	
5	JADHAV AJAY SHIVAJI	
6	LONDHE KOMAL RAJAENDRA	
7	PATIL SAYALI SATISH	
8	GHOGARE POOJA RAMESH	
9	PADOL PRAVIN SUKDEV	
10	KOTHALE MANISHA SUDAM	
11	THORAT PRASHANT LAXMAN	
12	NERPAGAR SHUBHAM VINAYAK	
13	NARKHEDE AMOL PRAMOD	
14	SONAWANE RUPALI DIPAK	
15	BHISE PANKAJ PAPU	
16	BAWASKAR SATISH RAMDAS	
17	RASNE AKASH DATTATRAY	
18	NEVAL DNYANESHWAR CHHAGANRAO	
19	DEORE HARSHAL RAVINDRA	
20	WADATKAR AKSHAY SUDHAKAR	
21	KULKARNI NIKHIL NARAYAN	
22	AMBEKAR SHRADDHA RAJENDRA	
23	KULKARNI GAURAV RAMESHRAO	
24	KADAM GANESH KAKASAHEB	
25	PIMPARKAR VAISHNAVI MUKUNDRAO	
26	POOJA BHANUDAS JADHAV	
27	JADHAV KALPANA LAXMAN	
28	SHITAL VISHWAS MURMUDE	

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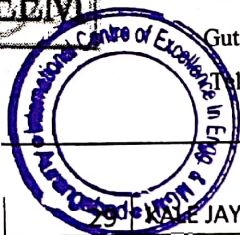
29	KALE JAYSHREE GANESH	
30	ZOPE AISHWARYA DONGER	
31	SHELAR VAISHALI RAJENDRA	
32	JUNDHARE MONIKA VISHNU	
33	ASHWINI DATTU KALE	
34	BODKHE JYOTI GOPINATH	
35	SHEIKH SHAIN SHABBIR	
36	PRAMOD RAMKRUSHNA ROTHE	
37	SURYAWANSHI POOJA BABASAHEB	
38	THOKE ANIL RAMRAO	
39	MOHAN RAM	
40	SHIVEE GUPTA	
41	PRAJAPATI ROHIT SUBHASHCHAND	
42	SONAWANE HRISHIKESH DAGADU	
43	SONKAMBLE PRAVINKUMAR SHANKAR	
44	YADAV KARAN KACHRU	
45	PRAJAPATI SURAJ DAYANAND	
47	DESHMUKH POOJA SUBHASHRAO	
48	MALI MOHINI RAJA	
49	SHEHALATA SARDAR RATHOD	
50	PATIL SONAL SADASHIV	
51	PATIL OMKAR SOMNATH	
52	PATIL GAYATRI CHATUR	
53	LABDE TUSHAR TUKARAM	
54	CHAVAN JAYASHREE MANSUB	
55	BHAWAR ROHIT DATTATRAY	
56	PAWAR VISHAL MAROTRAO	
57	SALE GANESH NANASAHEB	
58	BELE BHAGYASHRI BHAUSAHEB	
59	WADEKAR SAGAR SHIVAJI	
60	BHANDE GAURAV BALAJI	
61	PARDHI DILEEP SUNDARSHYAM	
62	PATIL TUSHAR SANTOSH	
63	CHAVAN BHAGWAT SAMPAT	

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Certificate Course Distribution Record EEE. Year:-2019-2020

Course Name:- S.E Introduction to Robotic Technology

Course Name:- T.E Basics of Robotic Technology

Course Name:- B.E Advance Robotic Technology

Sr.No.	Name of the Students	Signature
1	DHIRAJ GAWALI	
2	ANPAT SNEHAL SURESH	
3	RAHANE PUJA KADUNATH	
4	ATHWE DATTA ANIL	
5	KHODKE YOGITA PRAKASH	
6	THETE DIPALI RAJENDRA	
7	MALKAR ASHWINI GANESH	
8	MATHPATI RADHA SUKHANAND	
9	GAIKWAD SHIVANI SHANKAR	
10	CHUNCHEKAR MAITRI SIDDHARTH	
11	BHUMKAR SHIVAM CHANDRAKANT	
12	GHUGE BHARAT DNYANDEV	
13	CHAMLE RUTUJA RAJKUMAR	
14	BARAGAL DEEPALI KAKASAHEB	
15	WANKHEDE ADITI RAVINDRA	
16	THETE SACHIN DNYANESHWAR	
17	GAIKWAD SANDIP BABURAO	
18	JADHAO SAGAR RAJU	
19	UMALE SAGAR VISHWAS	
20	DHANDE PALLAVI PRAKASH	
21	JADHAV SWAPNIL SHIVRAM	
22	PATIL SAYALI SATISH	
23	KOTHALE MANISHA SUDAM	
24	NERPAGAR SHUBHAM VINAYAK	
25	BAWASKAR SATISH RAMDAS	
26	KULKARNI NIKHIL NARAYAN	
27	AMBEKAR SHRADDHA RAJENDRA	

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28	KULKARNI GAURAV RAMESHRAO	
29	THUBE CHHAYA TANHAJI	
30	RAMNIWAS BUGALIYA	
31	DAPKE VAISHALI SUDHAKAR	
32	MATHKARI SUMEDHA ACHYUTRAO	
33	LOKHANDE DIPALI MAHESH	
34	PIMPARKAR VAISHNAVI MUKUNDRAO	
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47	PAWAR SONALI BALASAHEB	
48	PRAMOD RAMKRUSHNA ROTHE	
49	KHAIRNAR VAIBHAV BHIMRAO	

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Certificate Course Distrubtion Record EEE SE, TE,BE :-2021-2022

Course Name for SE;- Introduction of Blockchain Technology .

Course Name for TE:- Basics of Blockchain Technology

Course Name for BE :-Advance in Blockchain Technology

Sr.No	Name Of Students	Signature
1	ARSUD SANDESH SUNDARLAL	
2	AVHALE SONALI ASHOKRAO	
3	BARGAL RAHUL SANJAY	
4	BHALE TEJAS NARENDRA	
5	BHAWAR AADESH MANOHAR	
6	BHOSKAR CHETAN BANDU	
7	CHINTALKAR JYOTI MANOHAR	
8	DANGE ANIKET RAJKUMAR	
9	DHAMNE SUDARSHAN SANTOSH	
10	DIGVIJAY ACHYUT MATHKARI	
11	GOHATRE PRIYA NARAYAN	
12	HIWALE AKASH GANGADHAR	
13	JADHAV GANESH BHARAT	
14	JADHAV GAURAV ABASAHEB	
15	JADHAV SONALI VILAS	
16	KAMBLE SHRIDHAR PRAKASH	
17	KANADE SUDARSHAN ARJUN	
18	KASBE DIPAK ANIL	
19	KERE RAVINDRA SURESH	
20	KHANDARE PRADIP DINKAR	
21	KOTIYE KISHOR KADU	
22	KULKARNI AKSHAY KASHINATH	
23	LANDE ABHISHEK BHAGWAT	
24	MOTE YOGESH CHANDRAKANT	
25	PATHAN SANA RASUL	
26	PAWAR DIPAK MHADA	
27	RAHADE SURAJ PANDURANG	
28	RATHOD AKASH NANDU	
29	RATHOD BHAUSAHEB DEVIDAS	

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No.	Name	Signature
30	RAUT VIKAS VISHWANATH	
31	RODE PRATHMESH HANUMANTRAO	
32	MHASKE RUSHIKESH SUBHASH	
33	SHAIKH SOHEL AJIM	
34	SHELKE ROHAN MUKESH	
35	SIDDIKI JIBRAM ERFAN	
36	THOMBRE ARJUN RAMESHWAR	
37	VASAVE NEHA SANJAY	
38		
39	**Name of Student**	
40	DHANDE PALLAVI PRAKASH	
41	JADHAV SWAPNIL SHIVRAM	
42	PATIL SAYALI SATISH	
43	KOTHALE MANISHA SUDAM	
44	NERPAGAR SHUBHAM VINAYAK	
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50	RAMNIWAS BUGALIYA	
51	DAPKE VAISHALI SUDHAKAR	
52	MATHKARI SUMEDHA ACHYUTRAO	
53	LOKHANDE DIPALI MAHESH	
62		
63	**Name of Student**	
64	ANPAT SNEHAL SURESH	
65	BARAGAL DEEPALI KAKASAHEB	
66	BHUMKAR SHIVAM	
67	CHAMLE RUTUJA RAJKUMAR	
68	CHUNCHEKAR MAITRI SIDDHARTH	
69	DEORE HARSHAL RAVINDRA	
70	GAIKWAD SANDIP BABURAO	
71	GAWALI DHIRAJ	
72	GHUGE BHARAT DNYANDEV	
73	JADHAO SAGAR RAJU	
74	KADAM GANESH KAKASAHEB	
75	KOLI LALIT	

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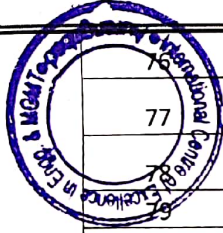
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77	MATHPATI RADHA SUKHANAND	
78	MOMIN AAKEF MOMIN ABUZER	
79	NEVAL DNYANESHWAR	
80	PADOL PRAVIN SUKDEV	
81	RAHANE PUJA KADUNATH	
82	RASNE AKASH DATTATRAY	
83	THORAT PRASHANT LAXMAN	
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85	WANKHEDE ADITI RAVINDRA	

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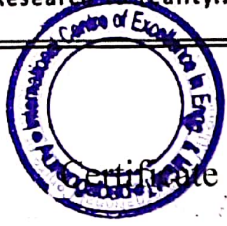
Certificate Course Distrubtion Record EEE SE, TE, BE :-2022-2023

Course Name for SE;- Introduction of Blockchain Technology .

Course Name for TE:- Basics of Blockchain Technology

Course Name for BE :-Advance in Blockchain Technology

Sr.No	Name of the Students	Signature
1	AUTE GOKUL KADUBA	
2	CHAUDHARI PRASHANT GANESH	
3	CHAVAN MAYURI ANNASAHEB	
4	GARAD ABHISHEKH MADHUKAR	
5	GAWARE ASHWINI BHAGWAN	
6	GHODKE ABHISHEK GANESH	
7	INGALE NIKHIL PRAKASH	
8	INGALE TRUPTI JALINDHAR	
9	JADHAV NILESH TARACHAND	
10	KULKARNI ATHARVA PRAVIN	
11	KULKARNI DHANANJAY UDDHAVRAO	
12	MAGAR KRUSHNA MANSUB	
13	MAGAR SUHAS POPAT	
14	MULE ABHISHEK ASHOK	
15	NIKAM SHUBHAM POPAT	
16	PADALE AJAY DINKAR	
17	PANAGE MANTHAN UMAKANT	
18	PATHADE KADUBAL SHIVAJI	
19	PATIL DIVESH ARUN	
20	PAWAR RUSHIKESH ISHWAR	
21	PAWAR RUTIK VILAS	
22	RAMTEKE POOJA SURESH	
23	RATHOD AVINASH SUBHASH	
24	RAUT VISHESH JAYKUMAR	
25	SAKHARE VISHAL VISHWAMBHAR	
26	SALUNKE SHUBHANGI BHARAT	

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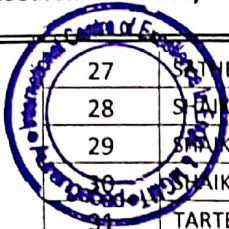
No.	Name	Signature
27	SATHE KOMAL ANKUSH	
28	SHAIKH AAFROJ SARDAR	
29	SHAIKH SOHEL HAMID	
30	SHAIKH CHAND SHAIKH NASIR	
31	TARTE ANJALI SHANKARAPPA	
32	TAWALE NISHA HANUMANT	
33	TURKAR UMESH PREMLAL	
34	UBALE RITESH JANARDAN	
35	VEER KUMAR BALU	
36	VISHWAKARMA ROHAN RAJESH	
37	Name of Students	
38	ARSUD SANDESH SUNDARLAL	
39	BAMANKAR KIRAN MADHAVRAO	
40	BHAWAR AADESH MANOHAR	
41	BHOSKAR CHETAN BANDU	
42	BURANGE AAKASH NATUBARAO	
43	GAIKWAD MANISHA DHARNDAS	
44	JADHAV GAURAV ABASAHEB	
45	JADHAV SONALI VILAS	
46	KADAM SATISH DHARMAJI	
47	KAMBLE SHRIDHAR PRAKASH	
48	KATURE VARSHA NANASAHEB	
49	KERE RAVINDRA SURESH	
50	KHANDARE PRADIP DINKAR	
51	KSHIRSAGAR SAROJ GOVIND	
52	LANDE ABHISHEKH BHAGWAT	
53	MATHKARI DIGVIJAY ACHYUT	
54	PATHAN SANA RASUL	
55	PATIL NEHA KAILAS	
56	RODE PRATHAMESH HANUMANT	
57	SHELKE SAGAR NAVNATH	
58	SHINDE AKASH ASHOK	
59	SOLANKE VINOD PANDURANG	
60	SONUNE SUNIL SAHEBRAO	
61	TAMBE VAISHALI BHAUSAHEB	
62	THOMBARE ARJUN RAMESHWAR	
63	THOMBARE DATTATRAY RAOSAHEB	
64	Name of Students	

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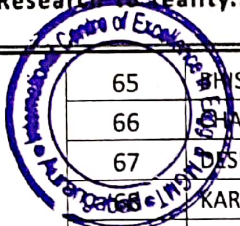
65	BHSE ANKUSH GAUTAM	
66	CHAUHAN PRAVEEN AMARJEET	
67	DESHMUKH MAHIMA KESHAV	
68	KARPE YOGESH MOTIRAM	
69	KSHIRSAGAR VISHAL RAMESH	
70	NIKAM SHIVANI ASHOK	
71	NIMGAONKAR ANKUSH RAJENDRA	
72	RAUT VAIBHAV MOHANLAL	
73	SALVE SANGHAMITRA SANTOSH	
74	SHAHARWALE VAIBHAV JANARDAN	
75	SHAIKH SHAHABAJ SATTAR	
76	SHAKIL KHAN LUKMAN KHAN	
77	SINGH ANMOL JAGROOP	
78	SONNE BHAUSAHEB KAILASH	
79	THETE AMOL BABAN	
80	THOKAL GANESH SITARAM	
81	THORAT ISHWAR RAMESHRAO	
82	THORAT MAHESH SUBHASH	
83	VAISHNAV ASHISH BHIKAN	
84	WAGH SAGAR LAKSHMAN	
85	WAGH SHIVAM ASHOK	
86	**JADHAV TEJAS BALAJI**	

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