(062-CSE-02-02) CSE (IOT & CYBERSECURITY WITH BLOCKCHAIN TECHNOLOGY)

Significance of the Program

The Internet of Things (IoT) is a pervasive technology that automates tasks and increases comfort, efficiency, and automation. Cybersecurity is a specialized field in IT that focuses on protecting computer systems, networks, and data from cyber-attacks. The profession is evolving due to the increasing rate of cybercrimes and the need for professionals in industries that transact online or carry sensitive data. Blockchain applications, beyond cryptocurrency, create transparency, fairness, and save businesses time and money. The demand for Blockchain skills is high, and professionals must possess skills that set them apart and make employers want to invest in them. This programme focuses on imparting essential skills for the integration of IoT, cyber security, and blockchain technology to address critical challenges in the era of interconnected devices.

Career Options

Pursuing a professional B.Tech program in CSE (IoT and Cybersecurity including Blockchain Technology) can explore the following opportunities:

- **IoT Security Specialist:** Focuses on securing IoT devices, networks, and platforms to ensure the integrity and confidentiality of data transmitted and processed by interconnected devices.

- **Blockchain Security Analyst:** Specializes in ensuring the security of blockchain networks, including securing smart contracts, preventing unauthorized access, and addressing vulnerabilities in blockchain implementations.

- **Cybersecurity Consultant for IoT:** Advises organizations on implementing robust cybersecurity measures for their IoT ecosystems, conducting risk assessments, and recommending strategies to enhance overall security.

- **IoT Architect:** Designs and plans the architecture of IoT systems, considering security aspects, data flows, and device interactions to create a scalable and secure ecosystem.

- **Cybersecurity Analyst:** Monitors and analyzes cybersecurity threats, conducts vulnerability assessments, and implements security measures to protect organizations from cyber-attacks.

- **Blockchain Solutions Architect:** Designs end-to-end solutions that leverage blockchain technology to address specific business challenges, ensuring security and optimal functionality.

Program Objectives

- To impart fundamental knowledge of securing IoT devices, networks, and data, and developing strategies to address the specific risks posed by interconnected devices.
- To inculcate cybersecurity principles and practices, emphasizing the protection of data, networks, and systems against cyber threats to foster industrial alliances for technical and socioeconomic growth for a sustainable future.
- To provide skills related to blockchain technology.

Outcomes of the Program

At the end of the program, the student will be able to:

- Design and implement secure Internet of Things (IoT) ecosystems, showcasing proficiency in identifying vulnerabilities and implementing security protocols.
- Demonstrate the ability to apply blockchain principles to enhance security, transparency, and data integrity.
- Demonstrate the ability to formulate and enforce security policies to safeguard digital assets and sensitive information.

Major Course Outline

1. Mathematical Foundations in Computer Science
2. **IoT Security and Privacy:** Focuses on the unique challenges presented by the Internet of Things, this module explores security considerations for IoT devices, networks, and data. Students will learn about authentication, authorization, and encryption techniques specific to IoT, as well as strategies for ensuring privacy in the context of interconnected devices.
3. **Cybersecurity Threats and Mitigation:** This module addresses common cybersecurity threats and vulnerabilities, providing students with the knowledge to identify, assess, and mitigate risks. Topics may include malware analysis, penetration testing, incident response, and strategies for securing networks and systems against cyber threats.
4. **Blockchain in Cybersecurity and IoT Applications**: Blockchain for Identity Management: Secure identity solutions using blockchain. Data Integrity in IoT: Ensuring

data integrity in IoT applications through blockchain. Blockchain for Critical Infrastructure Security: Applications of blockchain in securing critical IoT infrastructure.

5. **Secure DevOps and Cloud Security**: DevSecOps Principles: Integrating security into the DevOps lifecycle. Cloud Security: Security considerations for cloud-based environments. Container Security: Securing containerized applications in cloud and DevOps contexts.