

CSCS 458 - Internet of Things Security

UNIT I

Defining the IoT, Cybersecurity versus IoT security and cyber-physical systems, IoT uses today, The IoT in the enterprise, The IoT of the future and the need to secure.

Vulnerabilities, Attacks, and Countermeasures: Primer on threats, vulnerability, and risks (TVR), Primer on attacks and countermeasures, Today's IoT attacks, Lessons learned and systematic approaches. **Security Engineering for IoT Development:** Building security into design and development, Safety and security design, Processes and agreements, Technology selection – security products and services. (12 hours)

UNIT II

The IoT Security Lifecycle: The secure IoT system implementation lifecycle, Operations and maintenance, Dispose. **Cryptographic Fundamentals for IoT Security Engineering:** Cryptography and its role in securing the IoT, Cryptographic module principles, Cryptographic key management fundamentals, Examining cryptographic controls for IoT protocols, Future directions of the IoT and cryptography. **Identity and Access Management Solutions for the IoT:** An introduction to identity and access management for the IoT, Authentication credentials, IoT IAM infrastructure, Authorization and access control. (12 hours)

UNIT III

Mitigating IoT Privacy Concerns: Privacy challenges introduced by the IoT, Guide to performing an IoT PIA, PbD principles, Privacy engineering recommendations. **Setting Up a Compliance Monitoring Program for the IoT:** IoT compliance, A complex compliance environment. **Cloud Security for the IoT:** Cloud services and the IoT, Exploring cloud service provider IoT offerings, Cloud IoT security controls, Tailoring an enterprise IoT cloud security

architecture, New directions in cloud-enabled IOT computing. **IoT Incident Response:** Threats both to safety and security, Planning and executing an IoT incident response (12 hours)

Text Books:

1. Brian Russell and Drew Duren, “Practical Internet of Things Security”, Packt Publishing, 2016
2. Giancarlo Fortino and Carlos E. Palau “Interoperability, Safety and Security in IoT” Springer Publications 2017.
3. Zaigham Mahmood, Shijiazhuang, “Security, Privacy and Trust in the IoT Environment” Springer Publications, 2019.