

PIS206: ADVANCED TOPICS IN INFORMATION SECURITY

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Course Objectives: It deals with the problem of security in critical infrastructure and embedded systems, providing an understanding of the threats that malicious insiders pose and the actions to be taken against them.

Introduction & Overview: Critical Information Infrastructure (CII), Sectors, the need to protect our Critical Infrastructure and Key Resources (CIKR), Critical Information Infrastructure (CII): Characteristics, Types of Threats, Cyber Threats and Security.

Critical Information Infrastructure Protection Efforts: International Information Security Standards Infrastructure , Information Security initiatives in India

Vulnerability and Risk Analysis: Staged Methodology in Risk Analysis, Approaches and Consideration in Risk Analysis, Auditing Perspective in Risk Analysis, Network-level CIKR exploits for ACM, IEEE or other technical journals/articles, vulnerable systems such as the Internet, SCADA or PLC.

Embedded Computer Systems: Embedded Computer Systems ,their difference with Network based Computers, criminal exploitation in conjunction with embedded computer systems

Hacking: Hacking Embedded Systems. Identifying a command execution bug, Using standard Web Application assessment tools, Non-blind command injection, blind command injection

Threats, Vulnerabilities, and Risk Assessments: Characteristics and vulnerabilities of embedded systems, Attacks on embedded systems, Countermeasures. Programmability: Product Development Process

Safeguarding Embedded Systems: Reason for Embedded Security. Embedded Security Challenges, Security Expectations from a System, Defence Strategy.

Recommended Books

1. Critical Infrastructure Protection in Homeland Security: Defending a Networked Nation, Lewis, Ted G, Wiley-Interscience, 1st Edition, 2006.
2. Embedded Systems Security: Practical Methods for Safe and Secure Software and Systems Development, David Kleidermacher and Mike Kleidermacher, Newnes, 1st Edition, 2012
3. Risk Management for Security Professionals, Carl Roper, Butterworth-Heinemann, 1st Edition, 1999