राष्ट्रीय प्रौद्योगिकी संस्थान पटना / NATIONAL INSTITUTE OF TECHNOLOGY PATNA
(शिक्षा मंत्रालय, भारत सरकार के अधीन एक राष्ट्रीय महत्व का संस्थान / An Institute of National Importance under Ministry of Education, Gov. of India)
संगणक विज्ञान एवं अभियांत्रिकी विभाग / DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
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संदर्भ / Ref. CSE/_____ /20___ दिनांक / Date: _____

CS54119 Information Security

L-T-P-Cr: 3-0-0-3

Pre-requisites: Prior knowledge of fundamentals of Computer Networks, Operating Systems,

Objectives/Overview:

This course focuses on the fundamentals of information security that are used in protecting both the information present in computer storage as well as information traveling over computer networks. The course will help to understand the common threats faced today, the foundational theories behind information security, and the basic principles and techniques when designing a secure system.

Course Outcomes:
At the end of the course, a student should have:

S.No	Course Outcome	Mapping to POs
1.	Identify the appropriate technologies necessary to solve concrete problems related to confidentiality (cryptographic solutions), integrity (authentication such as biometrics), availability (for example, intrusion detection solutions), and privacy protection.	PO1, PO2
2.	Develop policies and procedures to manage enterprise security risks.	PO2, PO4
3.	Evaluate and communicate the human role in security systems, emphasizing ethics, vulnerabilities, and training.	PO2, PO3
4.	Apply cryptography and some key encryption techniques for providing secure solutions	PO3
5.	Determine appropriate mechanisms for protecting information systems (from operating systems to database management systems and applications).	PO2

UNIT I:

Lectures: 6

Core Information Security Principles, CIA(Confidentiality, Integrity, Availability), Information Security Management Governance, Security Policies, Procedures, Standards, Guidelines and Baselines, Organization Behavior and Security Models.

UNIT II:

Lectures: 10

Classical Cryptography, Modern Cryptography, A Taxonomy of Cryptography and Cryptanalysis. Symmetric and Asymmetric key algorithms.

UNIT III:

Lectures: 5

Information Risk Management – Concepts like Risk Acceptance, Risk Avoidance, Risk Mitigation, Risk Handling Strategies, and Risk Assessment

Information Classification – Guidelines, Types, and Criteria for Data Classification, Data Classification Procedures, and Classification Controls.

UNIT IV:

Lectures: 5

Threats, Vulnerabilities, Attack vectors and their countermeasures, Identity Management – Identification, Authorization and Access Controls – Categories, Models, Challenges, Principles, Techniques and Practices, Concept of trust and trustworthiness.

UNIT V:

Lectures: 7

Authentication Methods, Passwords, Biometrics, Challenge Response based authentication, Two-Factor Authentication, Single Sign-On, and Web Cookies.

UNIT VI:

Lectures: 5

Software Flaws, Malware, Operating System Security Functions, Trusted Operating System, Next Generation Secure Computing Base.

UNIT VII:

Lectures: 4

Ethics – Basic Concepts, Professional code of Ethics, Common Computer Ethics Fallacies (responsible disclosure), (cross reference SP/Professional Ethics / Accountability, responsibility, and liability), Hacking and Hacktivism

Text/ Reference Books:

1. Fundamentals of Information Systems Security By David Kim, Michael G. Solomon, Jones & Bartlett Learning
2. Information Security: The Complete Reference By Mark Rhodes Ousley, 2nd Edition. McGraw Hill

3. Information Security Principles and Practice By Mark Stamp, Wiley Publication
4. Enterprise Information Security and Privacy; By C. Warren Axelrod, Jennifer L. Bayuk, Daniel Schutzer, Artech House Press
5. Handbook of Information Security, Threats, Vulnerabilities, Prevention, Detection, and Management; Hossein Bidgoli, John Wiley & Sons
6. The Basics of Information Security, 2nd Edition; J Andress, Syngress Press; 2014