राष्ट्रीय प्रौद्योगिकी संस्थान पटना / NATIONAL INSTITUE OF TECHNOLOGY PATNA
संगणक विज्ञान एंव अभियांत्रिकी विभाग / DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
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No:- **Date:**

CSXX2839 Secure Software Systems
L-T-P-Cr: 2-0-2-3

Pre-requisites: Undergraduate Level of Computer Networks course

Learning Objectives:

1. To explore the foundations of software security
2. To apply contemporary formal mathematical modelling techniques to model and analyse the security of a software system.
3. To understand techniques at each phase of the development cycle that can be used to strengthen the security of software systems.

Syllabus:

UNIT I: Lectres: 8
Introduction to secure software system, Buffer overflow; Requirements: abuse & misuse cases, security requirements; Planning: risk assessment, Protection Poker OS command injection & Hardcoded credentials.

UNIT I: Lectres: 6
Design: secure design patterns, test planning, Design: architectural risk & threat modelling; Implementation: defensive coding practices, Web applications, Cross-Site Request Forgery, Code Inspections, File system permissions.

UNIT III: Lectres: 6
Cryptography: authentication, public-key, symmetric key, SSH Activity, Hashing salt.

UNIT IV: Lectres: 8
Deployment & Distribution: patching, security managers, Java security manager Java reflection, Black box testing.

UNIT V: Lectres: 8
Low level security: Memory layout, code injection, other memory exploits, format string vulnerabilities.

Textbook:

1. Gary McGraw, ―Software Security: Building Security‖, Addison-Wesley, ISBN 978-321-35670-3, 2006.

2. Julia H. Allen, Sean Barnum, Robert J. Ellison, Gary McGraw, and Nancy Mead. Addison-Wesley, ―Software Security Engineering: A Guide for Project Managers‖, ISBN 978-0-32-150917-8, 2008.
3. Charles P. Pfleeger and Shari Lawrence Pfleeger, ―Analysing Computer Security‖, Prentice Hall, Upper Saddle River, NJ, 2011. ISBN 978-0-13-278946-2.