

NIRMA UNIVERSITY
Institute of Technology
B. Tech Computer Science and Engineering
Semester VI
Department Elective-III

L	T	P	C
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Course Code	2CSDE72
Course Title	Secure Software Engineering

Course Outcomes:

At the end of the course, students will be able to –

1. identify software process vulnerabilities for an organization and interrelate security and software development process
2. design and develop a quality software project through effective team-building, planning, scheduling
3. implement security testing, verification and assessment of a software application.

Syllabus

**Teaching
Hours: 30**
07

Unit I

Building security into the software development lifecycle: security objectives, design guidelines for security, threat modelling, architecture and design for security, code review for security, security testing and deployment review for security

Unit II

Secure design principles and patterns: safety and reliability patterns, integration type patterns, concurrency patterns, data access patterns, Secure DevOps and CI, CD

Unit III

Secure software specifications and requirements: security frames, categories of vulnerabilities, application specific guidelines, deployment considerations
Secure software development practices: dealing with widespread security failures

Unit IV

Secure testing: security test plan, white box test, black box test, penetration testing, code review, test report

Unit V

Software quality assurance and benchmarking measurements: quality assurance elements, software quality assurance tasks and goals, statistical quality assurance, software reliability

Self-Study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.



Laboratory Work:

Laboratory work will be based on the above syllabus with minimum 7 experiments to be incorporated.

Suggested Readings[^]:

1. H, Allen J. Software Security Engineering. Pearson Education
2. Grembi, J. Secure Software Development: A Security Programmer's Guide. Course Technology
3. Viega, J. & McGraw, G., Building Secure Software: How to Avoid Security Problems the Right Way. Addison-Wesley
4. Gasser, M., Building a Secure Computer System. Van Nostrand Reinhold
5. Wysopal, C., Nelson, L., Dustin, E. & Zovi, D.D., The Art of Software Security Testing: Identifying Software Security Flaws. Pearson Education

L=Lecture, T=Tutorial, P=Practical, C=Credit

[^]this is not an exhaustive list