Unit Schedule

Week	Topics	Checklist
0		
1	Introduction to Software Security	• Information security (CIA), • network security, • software security
2	Secure Software Development Principles and Approaches	• Secure development lifecycle (2 models), • Vulnerability cycle, • Security v.s. functionality, • Trustworthy computing, • Secure software design principles, • High-level coding errors (input validations, API abuse…),
3	Threat Modeling and Mitigation Techniques	• Threat modeling concepts, • STRIDE, • DFDs (elements, trust boundaries, matched threats, case study), • Mitigations, • Validations
4	Secure (and Insecure) Coding Techniques I	• Input validation, • Regular expressions, • Buffer overflow (understanding, mitigations), • Format string vulnerabilities, • OS command injection
5	Secure (and Insecure) Coding Techniques II	• Integer overflow, • Array indexing error, • Principle of least privilege, • Cryptography - Random number, - Symmetric key encryption (one-time pad, stream cipher, block cipher, AES, ECB, CBC, Key reinstallation attacks), • Exception handling
6	Security Testing	• 3 levels of security testing, - risk-based testing, - source code review (white box, limitation, static code analysis) - penetration testing (black box testing), • Input validation vulnerability test (pattern-based), • Test plan,

		• Security testing for cloud-based apps
7	More on Security Testing	• Inferring source code errors(purpose, concepts of beliefs), • Access control (Functions, matrix, implementation concepts, role-based access control, unix file access control)
8	Web Application Security I	• Web programming (HTTP, SQL), • Web security (threats, OWASP, isolation), • SQL Injection, • Cookie
9	Web Application Security II	• Cross-site scripting, • On-site/cross-site request forgery
10	Mobile Security (by Dr Li Li)	Will not be accessed
11	Cloud Security (Encrypted DB)	Will not be accessed
12	Software Security in a Nutshell	Please go through the contents in this review very carefully
	SWOT VAC	No formal assessment is undertaken in SWOT VAC
	Examination period	

Lab Schedule

Week	Topics
0-1	No labs are taken
2	Password storage
3	Threat modeling
4	Buffer overflow
5	Format string and shellshock vulnerability
6	Code reviewing tool
7	Inferring source code error
8	Penetration testing 1

9	SQL injection
10	Penetration testing 2
11	XSS Scripting
12	Consultation