Secure Software Development

Module Information

2022.01, Approved

Summary Information

Module Code	5718YCOM
Formal Module Title	Secure Software Development
Owning School	Computer Science and Mathematics
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
YPC International College (Kolej Antarabangsa YPC)

Learning Methods

Learning Method Type	Hours
Lecture	22
Practical	22

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-PAR	PAR	January	12 Weeks

Aims and Outcomes

Aims	To familiarise students with common software security problems and vulnerabilities, and the methods, tools and techniques that can be used during software development to prevent them, including formal techniques.To provide students with an understanding of techniques that should be applied throughout the software development lifecycle in order to improve software security.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Analyse software security vulnerabilities and apply best-practice practical techniques to prevent them.
MLO2	2	Apply wide-ranging technical and conceptual security skills to the software development lifecycle.
MLO3	3	Use mitigation techniques to fix vulnerabilities that exist in complex software.
MLO4	4	Apply group-based development and testing principles to address a broad range of security issues.

Module Content

Outline Syllabus	Characteristics of large-scale software systems projects, team membership and activities.Common software vulnerabilities.Programming languages and security characteristics, decompilation and obfuscation. Integrating security into the software development lifecycle.Threat modelling.Formal techniques for vulnerability analysis.Testing, including practical experience of unit testing and fuzz testing. Networking vulnerabilities. Random number generation and cryptography.Secure deployment.General rules and guidelines; secure coding policies.Recent examples from computing are used throughout and practical exercises used to illustrate the applications of these concepts.
Module Overview	
Additional Information	Students will undertake a group software engineering task involving the application of secure software development lifecycles to a software development task. As part of this task, students will be expected to undertake a variety of roles as seen in a secure software development teams (i.e., developer, software tester, vulnerability researcher, report & documentation author, etc). Students will be expected to complete a report that demonstrates an understanding of how software should be designed, implemented, and tested to reduce the risk of security vulnerabilities. Students will also be expected to discover and mitigate vulnerabilities in software provided to them as part of this activity.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Technology	Software Development	80	0	MLO1, MLO2, MLO4
Presentation	Presentation on security task	20	0	MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Glyn Hughes	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings