



Module code	SSA_PCOM7E	NQF level	7
Credit value	10	Study duration	6 weeks

Secure Systems Architecture

Module description

This module introduces students to the underpinning concepts and principles of Secure Systems Architecture (SSA). This includes a review of the evolution of traditional operating systems architecture models, common security models, and the impact of distributed systems technologies on modern systems. The course will provide students with a combination of an understanding of operating systems, distributed services and the security aspects of both. Students will be introduced to the techniques in an engaging format, using a mixture of case studies, group work and individual activities.

This module aims to:

- Provide students with:
 - the ability to contextualise the basic architecture of modern operating systems
 - an understanding of the relationship between distributed systems and operating systems
 - an understanding and efficient application of the coding practices necessary for the development of secure systems
 - an understanding of the role of virtualisation in Secure Systems Architecture (SSA)
 - an appreciation of current and future challenges, limitations and opportunities
 - the opportunity to reflect on and evaluate personal development

Learning outcomes

On completion of this module, students will be able to:

- identify and critically analyse operating system risks and issues, and identify appropriate methodologies, tools and techniques to solve them
- evaluate and adapt platforms and systems, using processes such as code refactoring, to produce secure distributed system solutions
- critically analyse and evaluate solutions produced
- systematically develop and implement the skills required to be effective member of a development team in a virtual professional environment, adopting real-life perspectives on team roles and organisation

Syllabus

- Security through design and architecture: security models; review of OS approaches and principles (via case studies/ examples)
- Distributed system approaches (from Corba through to SOA, the web and microservices)
- Monoliths vs. microservices: virtualisation, containers and APIs.

Learning and teaching methods

The module will be delivered through the provision of specified reading materials on the virtual learning platform, which shall be supported by specified online discussion forums and lecturecasts. The flexible and participative approach of the module will develop a collaborative research inquiry in the advancement of computing, enabling them to accelerate in their chosen career.

Students will demonstrate their ability and strengths through evidence and reflections by maintaining an e-portfolio. The e-portfolio will also act as a means for assessment on evidence of personal growth and CPD.

Synchronous sessions will give students the opportunity to interact with fellow students and for tutor contact. The sessions will include live coding sessions to help students contextualise their knowledge. These synchronous sessions will be recorded in order to ensure that all students can access the material in their own time.

At pre-arranged days and agreed times during the module (usually weekly, prior to a synchronous session), the module tutor will be available for a drop in telephone or preparatory learning liaison session. This is to give students the opportunity to ask specific and general questions relating to the week's learning opportunities and enable them to contextualise their learning.

For team activities in this module, students will be grouped according to time zones to ensure team members can communicate easily with each other. Details on the process for team activities and peer assessment will be made available to students at the outset of the module.

Description of unit of assessment	Length/Duration	Submission date	Weighting
Development team project: design document	1 page (600 words equivalent)	Unit 3	30%
Development team project: code (API) development and rationale as well as evidence of testing	1,000 words equivalent	Unit 6	40%
Individual reflective piece with evidence of individual development tasks	800 words	Unit 6	30%