

## Course information 2025-26

# IS2182 Innovating Digital Systems and Services

### General information

**MODULE LEVEL:** 5

**CREDIT:** 30

**NOTIONAL STUDY TIME:** 300 hours

**MODE:** Locally Taught and Independent Learner Route Only (not available for Online Taught students)

### Summary

This course covers methods, values, attitudes, and techniques for building complex digital systems for business and society. It provides an understanding of the need for innovation and rigour. The course enables students to select and apply relevant methodological approaches to the development of well-designed and innovative digital systems and services.

### Conditions

Please refer to the relevant programme structure in the EMFSS Programme Regulations to check:

- where this course can be placed on your degree structure; and
- details of prerequisites and corequisites for this course.

You should also refer to the Exclusions list in the EMFSS Programme Regulations to check if any exclusions apply for this course.

### Aims and objectives

The aims of this course are to:

- introduce and familiarise students with the overarching concerns when innovating digital systems and services within organisational contexts,
- explain and assess the various processes, tasks and techniques that are employed in developing and improving digital systems and services,
- identify and discuss the main aspects of effective innovation project management,
- provide students with an experience of the way methods and techniques are applied in practice (this is achieved through the individual innovation project work).

## **Learning outcomes**

At the end of this course and having completed the essential reading and activities students should be able to:

- describe and discuss the expectations, pressures and problems faced when innovating digital systems within today's organisational context.
- critically assess the processes, tasks, practices, and tools that support digital systems innovation.
- explain how systems development processes can be applied in innovation.
- discuss the adoption of agile approaches for innovative system development.
- explain how mature software engineering practices are incorporated into system and service innovation within contemporary organisations.
- discuss the relevance of design features and principles within the process of digital systems innovation.
- assess the role of digital infrastructures in the development of innovative digital systems and services.
- identify and discuss the main innovation project activities in the context of today's organisations.
- demonstrate, through project work, the ability to analyse, design and evaluate a digital system and the ability to write a detailed report on the development process.

## **Employability skills**

Below are the three most relevant employability skills that students acquire by undertaking this course which can be conveyed to future prospective employers:

1. Creativity and innovation
2. Digital skills
3. Complex Problem Solving

## Essential reading

For full details, please refer to the reading list.

Pressman R.S. and Maxim B.R. Software Engineering: A Practitioner's Approach. (London: McGraw Hill, 2015) eighth edition [ISBN 978-1259253157] (**Essential**)

Beynon-Davies, P. Business Information Systems (London: Palgrave, 2020) third edition [978-1352007381] (**Further**)

## Assessment

This course is assessed by a three-hour and fifteen-minute closed-book written examination (60%) and coursework (40%).

## Syllabus

This syllabus covers the tasks, attitudes and values which underlie professional practices for digital systems development and innovation. The emphasis is on how to develop innovative digital systems capitalising on new innovations (e.g., mobile Apps, Cloud Computing etc.) while still ensuring quality and robustness through relevant adoption of formal development methods.

**Background:** the changing nature of digital systems and the implications for innovation processes; history of information systems development; process models and their characteristics: the lifecycle model, evolutionary system development, incremental system development; an introduction to innovation and evolution of digital systems.

**System innovation within a digital economy:** opportunities and challenges; identifying and maximising the benefits of ubiquitous technologies within the business; the changing nature of systems: Web Apps, Mobile Apps, Cloud computing; the need for flexible and speedy system development; start-ups – culture, capital, and process.

**Agile development:** agile methods, extreme programming, scrum, agility in organisations: DevOps.

**Innovation tasks:** knowing what to build - acquiring and specifying requirements, identifying, and modelling architectural views, component-level design, testing, code generation; creating usable systems - user experience design, structuring and analysing data; object-oriented modelling using UML: the use case diagram, the class diagram, the object sequence diagram, the activity diagram; the deployment diagram.

**Trends within the digital innovation process:** features of good design, object-orientation, reasons for reuse, concept reuse, patterns, component-based system development, cloud computing, development platforms, low-code development, system of systems. Project management: innovation project planning, innovation project control.