

# WM144-18 Operating Systems in the Cyber Context

**20/21**

**Department**

WMG

**Level**

Undergraduate Level 1

**Module leader**

Tim Watson

**Credit value**

18

**Module duration**

30 weeks

**Assessment**

100% coursework

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

An operating system performs two main tasks. Firstly, it provides a simplified, logical view of a computer where the quirks of particular hardware devices and the intricacies of their use are hidden behind consistent software interfaces. The operating system also provides several powerful, simplifying views of aspects of the computer such as files, folders and processes, none of which actually exists. Secondly, it manages the resources offered by a computer, making sure that, if there are several active users, they get their fair share of the CPU, memory, storage and peripherals. Even if there is only one user, they may be running several programs at once and the operating system will manage the competing demands from each program. This module will outline the principles of how an operating system is constructed, how it works, and its critical role in cyber security. This module gives a solid understanding of how a modern operating system satisfies its requirements in the cyber context.

### Module aims

- 1 – Articulate the key principles behind the organisation and operation of a typical general-purpose operating system.
- 2 – Explain how simple process, memory and file management algorithms and data structures

work.

3 – Select and apply security and protection mechanisms.

## **Outline syllabus**

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Outline content

The content of this module will be taught from a cyber security perspective.

- Overview of operating systems
- Operating system principles
- Concurrency and synchronisation
- Scheduling and dispatch
- Memory management
- Security and protection
- File systems
- Interaction and network communication

## **Learning outcomes**

By the end of the module, students should be able to:

- 1 – Articulate the key principles behind the organisation and operation of a typical general-purpose operating system.
- 2 – Explain how simple process, memory and file management algorithms and data structures work.
- 3 – Select and apply security and protection mechanisms.

## **Indicative reading list**

Love, Robert, "Linux System Programming: Talking Directly to the Kernel and C Library", 2 Ed, O'Reilly (2013)

Silberschatz, Abraham, Galvin, Peter B., Gagne, Greg, "Operating System Concepts", 9 Ed, Wiley (2013)

Tanenbaum, Andrew S., Bos, Herbert, "Modern Operating Systems", 4 Ed, Pearson (2014)

## **Subject specific skills**

- 1 – Articulate the key principles behind the organisation and operation of a typical general-purpose operating system.
- 2 – Explain how simple process, memory and file management algorithms and data structures work.
- 3 – Select and apply security and protection mechanisms.

## **Transferable skills**

Critical thinking

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## Study

### Study time

Type	Required
Supervised practical classes	18 sessions of 3 hours (30%)
Private study	43 hours (24%)
Assessment	83 hours (46%)
Total	180 hours

### Private study description

Independent activity between workshops.

### Costs

No further costs have been identified for this module.

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## Assessment

You do not need to pass all assessment components to pass the module.

### Assessment group A

	Weighting	Study time
Coursework 1	80%	
Coursework 2	20%	

### Feedback on assessment

Written feedback for each assignment  
Verbal feedback during tutorial sessions  
Solutions provided to tutorial questions  
Summative feedback on assignments and exam

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## Availability

## **Courses**

This module is Core for:

- UWMA-H651 Undergraduate Cyber Security
  - Year 1 of H651 Cyber Security
  - Year 1 of H651 Cyber Security
  - Year 1 of H651 Cyber Security