



**London
South Bank
University**

EST 1892

Module Guide

Operating Systems

CSI-5-OSY

School of Engineering

2019 - 2020

L5

Table of Contents

1.	Module Details	3
2.	Short Description.....	3
3.	Aims of the Module	3
4.	Learning Outcomes.....	3
4.1	Knowledge and Understanding	3
4.2	Intellectual Skills.....	3
4.3	Practical Skills	3
4.4	Transferable Skills.....	3
5.	Assessment of the Module.....	4
6.	Feedback	4
7.	Introduction to Studying the Module	4
7.1	Overview of the Main Content.....	4
7.2	Overview of Types of Classes	4
7.3	Importance of Student Self-Managed Learning Time	4
7.4	Employability	5
8.	The Programme of Teaching, Learning and Assessment	5
9.	Student Evaluation	5
10.	Learning Resources	5
	Reading List	5

1. MODULE DETAILS

Module Title:	Operating Systems
Module Level:	L5
Module Reference Number:	CSI-5-OSY
Credit Value:	20
Student Study Hours:	200
Contact Hours:	65
Private Study Hours:	135
Pre-requisite Learning (If applicable):	None
Co-requisite Modules (If applicable):	None
Course(s):	BSc(Hons) Information Technology
Year and Semester	2018-2019 Semester 1
Module Coordinator:	Christos Chrysoulas
MC Contact Details (Tel, Email, Room)	020 7815 7460, chrysouc@lsbu.ac.uk, FW-201
Teaching Team & Contact Details (If applicable):	Christos Chrysoulas
Subject Area:	Information
Summary of Assessment Method:	Courseworks, Exam
External Examiner appointed for module:	TBC

2. SHORT DESCRIPTION

An operating system is a computer program that acts as an intermediary between users and their application programs and, on the other hand, the computer hardware. Operating systems are highly complex software artefacts. This module covers all aspects of the design of operating systems and the functions they perform. It also covers related technologies such as virtualisation and CPU features for maximising performance.

3. AIMS OF THE MODULE

This module aims to give students an understanding of modern operating systems and their implementation, the principles of data transmission, protocols and security issues, and the characteristics of various kinds of computer networks. The students should be in position to:

1. Work in a UNIX environment and write shell scripts.
2. Develop code to implement key real-time optimisation techniques.
3. Apply the principles associated with process management and inter-process communications.
4. Demonstrate an understanding of the hardware architecture of modern computer platforms.

4. LEARNING OUTCOMES

4.1 Knowledge and Understanding

Describe and categorise operating system designs and strategies for a large range of functionality including memory management, process scheduling and file systems.

4.2 Intellectual Skills

Select the algorithms and design strategies required for a diverse range of fundamental computer functionality.

4.3 Practical Skills

Configure and make effective use of operating system facilities.

4.4 Transferable Skills

Analyse problems and identify strategies for their solutions.

5. ASSESSMENT OF THE MODULE

Coursework (60%)

The coursework assessment for this module is expected to consist of three in-class tests. The first test will consist of: True /False, Multiple Choice, Fill the gap and the next two will also have one to two exercises for the students to deal with .

Final Exam (40%)

The exam will consist of a 2-hour closed-book unseen paper

6. FEEDBACK

Feedback will normally be given to students 15 working days after the final submission of an assignment or as advised by their module leader.

General feedback, applying to all students, will also be placed on the module VLE site within 15 working days.

7. INTRODUCTION TO STUDYING THE MODULE

7.1 Overview of the Main Content

- Role and purpose of the operating systems
- Design issues (efficiency, robustness, flexibility, portability, security)
- Monolithic, micro-kernel and hybrid architecture
- Concepts of application program interfaces
- Physical memory, caches and memory management hardware
- Paging and virtual memory
- Context switching
- Pre-emptive and non-pre-emptive scheduling
- Processes and threads
- Multi-core processors
- Protection, access control, and authentication
- File systems
- Virtualisation

7.2 Overview of Types of Classes

The module will be delivered using a combination of lecture/seminar sessions and computer lab/workshop sessions. The lecture/seminars will consist of the delivery, discussion and intellectual investigation of factual and conceptual material. The laboratory sessions will consist of practical exercises using relevant technologies and provide opportunities for students to develop their understanding through independent experimentation.

7.3 Importance of Student Self-Managed Learning Time

Student responsibility in the learning and development process will be emphasised. Students are required to undertake directed self-study and prepare solutions/discussions to questions relative to various topic areas. Students will be encouraged to identify for themselves particular problems of difficulty and to use seminar discussions, where appropriate, for the resolution of these. Students must regularly access the Moodle site for

this module. They should download the class/lecture material from the Moodle site, and do the recommended reading, before each lecture/class.

Where appropriate, students are also expected to download the relevant seminar questions and study them in advance of each seminar, in order to derive maximum benefit from seminar time. The programme of teaching, learning and assessment gives guidance on the textbook reading required for each week, the purpose of which is to encourage further reading both on and around the topic.

7.4 Employability

A good understanding of modern computer operating systems, data transmission principles, protocols, security issues and computer network operation, and an ability to work with or analyse them as appropriate, is to be expected of all prospective computing professionals.

8. THE PROGRAMME OF TEACHING, LEARNING AND ASSESSMENT

SEMESTER 1		
WEEK	LECTURE SCHEDULE	LABORATORY SCHEDULE
1	Computer/Operating System Overview	Setting Up a Virtual Machine
2	Virtual Machines - Virtualization	Introduction to Minix, Linux...
3	Process Description and Control	Linux Overview
4	Threads	1 st In Class Test
5	Concurrency: Mutual Exclusion and Synchronization	Shell Programming
6	Concurrency: Deadlock and Starvation	Shell Scripting
7	Memory Management And Virtual Memory	File Systems – Files in Linux
8	Uniprocessor Scheduling	2 nd in Class Test
9	Multiprocessor, Multicore and Real-Time Scheduling	Processes - Threads
10	I/O Management and Disk Scheduling	Deadlocks
11	File Management	Input - Output
12	Embedded Operating Systems	3 rd In class Test

9. STUDENT EVALUATION

[Click and replace. A brief summary of the previous module cohort's evaluation and any changes made as a result.]

10. LEARNING RESOURCES

Reading List

- Stalling, W. (2015) Operating Systems: Internals and Design Principles, Pearson Education; 8th edition, ISBN-10: 1292061359
- Tanenbaum, A., Bos, H. (2017) Modern Operating Systems: Global Edition, Pearson Education; 4th edition, ISBN-10: 1292061421

The online version of this reading list can be found on Reading Lists Online: <http://readinglists.lsbu.ac.uk>.

A brief description to LLR services:

Library and Learning Resources (LLR)

Library webpage: <https://libguides.lsbu.ac.uk/subjects> > select your subject (e.g. Electrical and Electronic Engineering). On every subject guide, you can

- search for books and e-books, journal articles and British Standards;
- get help about referencing your work and how to avoid plagiarism;
- contact us for training and 1:1 support

Electronic resources are available 24/7 and are accessible from home.

Library support for students:

- You are encouraged to book additional workshops to learn how to find research materials and reference them: MyLSBU > Library > Events and Workshops
- Visit the drop-in Research Help Desk located on Level 3 Bridge in the Perry Library (open Monday-Friday 11:00-16:00 term time).
- If you would like further help, please contact the Information Skills Librarian at: LLReng@lsbu.ac.uk.

Students IT support and training

- Students can contact LRC for IT issues such as LSBU account, printing, and accessing wifi network: LLRithelpdesk@lsbu.ac.uk. IT workshops can be booked via MyLSBU > Library > Events and Workshops.
- If you need further help in using a particular software (e.g. Excel or SPSS) or application, please contact IT and Digital Skills Training team: digitalskills@lsbu.ac.uk

Self-learning materials on Lynda.com

LSBU has subscribed to video platform called Lynda.com. It has 4000+ video courses in different technology areas including MatLab, project management and Excel applications.

How to sign up: go to <https://www.lynda.com/> and click "Sign In". Click 'Sign in with your organization portal', and type lsbu.ac.uk. Continue. Follow the steps to enter your LSBU logins.