

MODULE SPECIFICATION

Name of Module		Operating Systems					
Parent School/Dept		Computer Science					
Programme(s) where module is offered		BSc Computer Science with Electrical Engineering; BSc Computer Science with Economics; BSc Computer Science with Business; BSc Computer Science with International Relations; BSc Computer Science with Political Science;					
Status (core, option, free choice)		Core		Pre-Requisite Modules or Qualifications		CSIS110 CSIS130	
FHEQ Level	5	Unit Value	6 ECTS	Module Code	CS245	Module coordinator	Dr. Zanin Vejzovic
Term taught		Spring		Applicable From		2016	

Educational Aims of the Module

The main aim of the module is instilling knowledge of essential principles of how modern operating systems work, and exploring the basic facts about how they can be implemented. The programming examples are given in the programming language C, and sometimes in the assembler.

Module Outline/Syllabus

- Introduction to Operating Systems. History of Operating Systems. Operating System concepts. System calls. Operating Systems structure. Software and applications.
- Introduction to processes. Interprocess communication. Classical interprocess communication problems. Scheduling.
- Principles of I/O hardware. Principles of I/O software. Deadlocks. Block devices. Disks. Terminals.
- Introduction to memory management. Basic memory management. Swapping. Virtual memory. Page replacement algorithms. Design issues for paging systems. Segmentation.
- Introduction to file system. Files. Directories. File system implementation. Security. Protection mechanisms.
- Module Review and Conclusion.

Student Engagement Hours

Type	Number per Term	Duration	Total Time
Lectures	30	2 hours	60 hours
Laboratory sessions	15	2 hours	30 hours
Total Guided/Independent Learning Hours			60 hours
Total Contact Hours			90 hours
Total Engagement Hours			150 hours

Assessment Method Summary

Type	Number Required	Duration / Length	Weighting	Timing/Submission Deadline
Final exam	1	180 minutes	50%	End of semester
Mid-term exam	1	90 minutes	20%	Mid-semester (8 th week)
Project (individual/group)	1	1,500 words	10%	14 th week
Test	2	90 minutes	20%	5 th and 13 th week

Module Outcomes		
<p><u>Intended Learning Outcomes:</u></p> <ol style="list-style-type: none"> 1. Understanding core concepts of modern operating systems 2. Understanding how operating systems may be implemented 3. Understanding the role of operating systems in human-machine communication 4. Understanding basic system programs in C language 	→	<p><u>Teaching and Learning Strategy:</u></p> <ol style="list-style-type: none"> 1. Lectures are essential not only for the knowledge but also for understanding where it came from (ILO:1-4) 2. Laboratory sessions use examples and solutions to illustrate the theory (ILO:2, 4) 3. Practical lessons provide a series of programming exercises based on using low-level system calls in C programming language on MINIX operating system (ILO:2, 4) 4. Illustrative examples can serve as fundamentals to many other disciplines (ILO:1, 2, 3)
	→	<p><u>Assessment Strategy</u></p> <ol style="list-style-type: none"> 1. Midterm exam (ILO:1, 3, 4) 2. Final exam (ILO:1-4) 3. Test (ILO:1-4) 4. Project (ILO:1-4) 5. Laboratory sessions (ILO:1-4)
<p><u>Practical Skills</u></p> <ol style="list-style-type: none"> 1. Practical working with Windows-based and UNIX-based operating systems 2. Practical low-level programming in C using some basic POSIX calls 	→	<p><u>Teaching and Learning Strategy:</u></p> <ol style="list-style-type: none"> 1. Laboratory sessions (PS: 1-2) 2. Project (PS:1-2) 3. Test (PS:2)
	→	<p><u>Assessment Strategy</u></p> <ol style="list-style-type: none"> 1. Mid-term exam (PS:1-2) 2. Final exam (PS:1-2) 3. Test (PS:1-2) 4. Project (PS:1-2)
<p><u>Transferable Skills</u></p> <ol style="list-style-type: none"> 1. IT Skills 2. Numeracy Skills 3. Written and oral communication skills 4. Research skills 	→	<p><u>Teaching and Learning Strategy:</u></p> <ol style="list-style-type: none"> 1. Laboratory sessions (TS:1-3) 2. Project (TS:1-4)
	→	<p><u>Assessment Strategy</u></p> <ol style="list-style-type: none"> 1. Mid-term exam (TS:1-2) 2. Final exam (TS:1-2) 3. Test (TS:1-2) 4. Project (TS:1-4)

Key Texts and/or other learning materials
<p>Set Text</p> <ul style="list-style-type: none"> • Abraham Silbershatz, Peter B. Galvin, Greg Gagne. <i>Operating Systems Concepts</i>. Wiley. ISBN-13: 9781118093757 (updated December 2018) <p>Supplementary Materials</p> <ul style="list-style-type: none"> • Tanenbaum, A., (2015), <i>Operating Systems Design and Implementation</i>, 3rd edition, Pearson • Tanenbaum, A., (2014), <i>Modern Operating Systems</i>, 3rd edition, Pearson Education • Stallings, W., (2014), <i>Operating Systems: Internals and Design Principles</i>, 8th Edition, Pearson

Please note: This specification provides a concise summary of the main features of the module and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module and programme can be found in the departmental or programme handbook. The accuracy of the information contained in this document is reviewed annually by the University of Buckingham and may be checked by the Quality Assurance Agency.

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