1.	Course title	Operating systems		
2.	Course code			
3.	Study program	FINKI, IKI, ASI		
4.	Unit offering the course	**FCSE**		
5.	Undergraduate/postgraduate/PhD	**Undergraduate**		
6.	Year/semester 3/semester/elective	7. ECTS: **6**		
8.	Teacher(s)	d-r Dimitar Trajanov, d-r Nevena Ackovska, d-r Vesna Dimitrova, d-r Boro Jakimovski, d-r Igor Mishkovski		
9.	Course prerequisites	Object oriented programming, Computer architecture		
10.	Goals (competences): The student will be presented with the basic building blocks of modern operating systems through their concrete implementation in Windows and UNIX-like systems.			
11.	Course content: Overview of operating systems, role, history and functionality. Definition of operating systems, their principles organization of devices and states. Processes and threads and their management. Concurrency, states, state diagrams and their implementation structures. Resource scheduling, principles of scheduling, management of events, deadlocks and their resolution. Memory management, types of memory devices, overlay, swap, and partitioning. Device management, devices with serial and parallel connections, direct memory access and strategies for buffering. File systems basic concepts, elements and structure of directories, memory mapped files, naming, searching and access, and security strategies. Basic elements of security, overview, methods and devices, access and authenticaton, models of security, memory security. CASE STUDIES: Windows, Linux and embedded operating systems.			
12.	Teaching methods: Teaching, supported by slides, interactive lecturing, exercises, projects, guest lectures, using online collaboration/commnication environments.			
13.	Total available time	6 ECTS x 30 hours = 180 hours		
14.	Distribution of the available time	30+60+30+30+30 = 180		
15.	Teaching activities	15.1.	Lectures	30 hours
		15.2.	Training (labs, problem solving), seminar and team work	60 hours
16.	Other activities	16.1.	Project work	30 hours
		16.2.	Self study	30 hours
		16.3.	Home work	30 hours
17.	Grading			

	17.1.	Tests	70 points
	17.2.	Seminar work/project (written or oral presentation)	20 points
	17.3.	Active participation	10 points
18.	Grading criteria	to 49 points	5 (five) (F)
		from 50 to 59 points	6 (six) (E)
		from 60 to 69 points	7 (seven) (D)
		from 70 to 79 points	8 (eight) (C)
		from 80 to 89 points	9 (nine) (B)
		from 90 to 100 points	10 (ten) (A)
19.	Final exam prerequisites	15.1 and 15.2	
20.	Course language	Macedonian and English	
21.	Quality assurance methods	Mechanisms of internal evaluation and polls	

22. Literature

22.1. Compulsory

No.	Authors	Title	Publisher	Year
1.	Tanenbaum, A.S.	Modern Operating Systems 3rd edition	Prentice Hall	2007
2.	Abraham Silberschatz, Peter B. Galvin, Greg Gagne	Operating System Concepts 8th edition	Wiley	2008
3.	William Stallings	Operating Systems: Internals and Design Principles (7th Edition)	Prentice Hall	2011

22.2. Mandatory

No.	Authors	Title	Publisher	Year
1.	Jose Garrido, Richard Schlesinger, Kenneth E. Hoganson	Principles Of Modern Operating Systems	Jones & Bartlett Learning	2011
2.	Richard Blum, Christine Bresnahan	Linux Command Line and Shell Scripting Bible	Wiley	2011
3.				