

**UNIVERSITY OF ECONOMICS - VARNA**  
**MASTER DEGREE STUDIES CENTER**  
**DEPARTMENT „INFORMATICS“**

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**ACCEPTED BY:**

**Rector:**

(Prof. Dr. Plamen Iliev)

**SYLLABUS**

**SUBJECT: “OPERATING SYSTEMS”;**

**DEGREE PROGRAMME: “Computer Science”; MASTER`S DEGREE**

**YEAR OF STUDY: 5; SEMESTER: 9 (other fields graduates);**

**TOTAL STUDENT WORKLOAD: 360 h.; incl. curricular 60 h.**

**CREDITS: 12**

**DISTRIBUTION OF WORKLOAD ACCORDING TO THE CURRICULUM**

<i>TYPE OF STUDY HOURS</i>	<b>WORKLOAD, h.</b>	<b>TEACHING HOURS PER WEEK, h.</b>
<b>CURRICULAR:</b>		
incl.		
• LECTURES	30	2
• SEMINARS (lab. exercises)	30	2
<b>EXTRACURRICULAR</b>	300	-

Prepared by:

1. ....  
(Assoc. Prof. Dr. Nadezhda Filipova)

2. ....  
(Assist. Prof. Radka Nacheva)

Head of department: .....  
“Informatics” (Prof. Dr. Vladimir Sulov)

## I. ANNOTATION

Operating system (OS) are an essential part of computer systems. The goal of this course is to provide the students with knowledge on the operating system architecture and their basic mechanisms. Some core concepts and implementation techniques are focused. The internal mechanisms of the basic components of operating systems (Kernel, Process Manager, Memory Manager, I/O System, File System, Security System) are presented.

The course contributes to the students' professional knowledge in the following ways: In-depth understanding of modern OS; Insight in the design principles; Working in virtualized environment; OS administration skills; Troubleshooting and security skills; Learning to manage OS complexity.

## II. THEMATIC CONTENT

No. by row	TITLE OF UNIT AND SUBTOPICS	NUMBER OF HOURS		
		L	S	L.E.
<b>TOPIC 1. BASIC CHARACTERISTICS OF OS</b>		<b>4</b>		<b>2</b>
1.1	Purpose and functions. Evolution and modern trends			
1.2	Core concepts			
<b>TOPIC 2. OS ARCHITECTURE</b>		<b>4</b>		<b>4</b>
2.1	Basic architecture			
2.2	MicrosoftWindowsarchitecture			
<b>TOPIC 3. SYSTEM MECHANISMS</b>		<b>2</b>		<b>2</b>
3.1	Trap dispatching			
3.2	Resource management			
<b>TOPIC 4. PROCESSES AND THREADS MANAGEMENT</b>		<b>4</b>		<b>2</b>
4.1	Process structure			
4.2	Thread structure. Thread scheduling			
<b>TOPIC 5. MEMORY MANAGEMNT</b>		<b>4</b>		<b>2</b>
5.1	Functions			
5.2	Virtual addresses.Virtual pages management			
<b>TOPIC 6. INPUT/OUTPUT SYSTEM</b>		<b>2</b>		<b>2</b>
6.1	Functions, components and mechanisms			
6.2	Device drivers			
<b>TOPIC 7. FILE SYSTEM</b>		<b>4</b>		<b>6</b>
7.1	Functions and structure			
7.2	Disk structure and management			
<b>TOPIC 8.SECURITY SYSTEM</b>		<b>2</b>		<b>4</b>
8.1	Functions and structure			
8.2	Security model in MicrosoftWindows			
<b>TOPIC 9. OS ADMINISTRATION</b>		<b>4</b>		<b>6</b>
<b>Total:</b>		<b>30</b>		<b>30</b>

### **III. FORMS OF CONTROL:**

<b>No. by row</b>	<b>TYPE AND FORM OF CONTROL</b>	<b>№</b>	<b>Extra-curricular, h.</b>
<b>1.</b>	<b>Midterm control</b>		
1.1.	Test (open and/or closed questions)	2	100
1.2.	Practical assignments	2	60
	<b>Total midterm control:</b>	<b>4</b>	<b>160</b>
<b>2.</b>	<b>Final term control</b>		
2.1.	Test (open and/or closed questions)	1	140
	<b>Total final term control:</b>	<b>1</b>	<b>140</b>
	<b>Total for all types of control:</b>	<b>5</b>	<b>300</b>

### **IV. LITERATURE**

#### **REQUIRED(BASIC) LITERATURE:**

1. Russinovich, M., D. Solomon, A. Ionescu. Windows Internals (Part 1&2). Microsoft Press, 2012.
2. Tanenbaum, A. Operating Systems Design and Implementation. 3rd ed. Pearson Prentice Hall, 2006.

#### **RECOMMENDED(ADDITIONAL)LITERATURE:**

1. Bott, Ed. Introducing Windows 10 for IT Professionals. Microsoft Press, 2015.
2. Silberschatz, A., Galvin, P., Gagne, G. Operating System Concepts. John Wiley & Sons. Inc.