

**Course Name : Advanced Operating Systems**

Course Code	Course Type	Regular Semester	Lecture (hours/week)	Seminar (hours/week)	Lab. (hours/week)	Credits	ECTS
CMP 405	B	Fall	3.00	1.00	0.00	3.50	6.00

<b>Lecturer</b>	Sadije Bushati, Prof. Dr
<b>Assistant</b>	Armand Agolli, Msc
<b>Course language</b>	Albanian
<b>Course level</b>	Master
<b>Description</b>	This course covers advanced topics in operating systems, including process and thread management, synchronization, inter-process communication, distributed systems, and OS security. It takes both an analytical and practical approach to understanding how modern systems operate and how they are designed and evaluated.
<b>Objectives</b>	To understand advanced concepts of modern operating systems. To analyze resource management mechanisms in complex systems. To develop the ability to identify and solve problems in multithreaded and distributed environments.
<b>Core Concepts</b>	Process and thread management Synchronization and inter-process communication Multiprocessor and distributed systems Memory management and CPU scheduling Security and protection in operating systems

**Course Outline**

Week	Topic
1	Mini, Tower and Rack Server Systems. Server Operating Systems, Windows, Linux, Unix, Novell.
2	Installing Windows Server 2019. Password Policies, installing drivers.
3	Creating and managing Active Directory in Windows Server.
4	Server Roles. Adding and removing specific roles.
5	Users and Groups in Windows Server
6	Configuring File Server. Managing share rights and NTFS permissions
7	Configuring Print Server. Managing printers and their rights in AD
8	Midterm Exam
9	Configuring DHCP. Managing DHCP clients and server in a system with a minimum of 2 LANs.
10	Configuring security policies and groups on the Server. Managing them.
11	Using Powershell to configure the Server environment
12	Managing Windows Server Updates through WSUS servers
13	Configuring Virtual Machines in the Hyper V environment
14	Managing Virtual Machines in the Hyper V environment
15	Presentation of the Course Project
16	Final Exam

<b>Prerequisites</b>	The student must attend the course at a minimum rate of 75%.
<b>Literature</b>	<ul style="list-style-type: none"> <li>• Andrew S. Tanenbaum, Herbert Bos – Modern Operating Systems, 4th Edition, Pearson, 2014.</li> </ul>
<b>References</b>	<ul style="list-style-type: none"> <li>• Abraham Silberschatz, Peter B. Galvin, Greg Gagne – Operating System Concepts, 10th Edition, Wiley, 2018.</li> <li>• Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau – Operating Systems: Three Easy Pieces, 1st Edition, Arpaci-Dusseau Books, 2018.</li> <li>• William Stallings – Operating Systems: Internals and Design Principles, 9th Edition, Pearson, 2018.</li> </ul>

<b>Course Outcome</b>	
<b>1</b>	Students will be able to analyze the structure and operation of advanced operating systems.
<b>2</b>	They will apply resource management techniques in multiprocessor and distributed environments.
<b>3</b>	They will understand challenges and solutions in designing modern OS features such as virtualization and containerization.
<b>4</b>	They will be capable of developing or analyzing OS components with a focus on security and performance.

<b>Course Evaluation</b>		
<b>In-term Studies</b>	<b>Quantity</b>	<b>Percentage</b>
Midterms	1	20
Quizzes	0	0
Projects	1	30
Term Projects	0	0
Laboratory	0	0
Class Participation	0	0
<b>Total in-term evaluation percent</b>		<b>50</b>
<b>Final exam percent</b>		<b>50</b>
<b>Total</b>		<b>100</b>

<b>ECTS Workload (Based on Student Workload)</b>			
<b>Activities</b>	<b>Quantity</b>	<b>Duration (hours)</b>	<b>Total (hours)</b>
Course duration (Including the exam week: 16x Total hours of the course)	16	4	64
Study hours outside the classroom (Preparation, Practice, etc.)	14	5	70
Duties	1	10	10
Midterms	1	3	3
Final Exam	1	3	3
Other	1	0	0
<b>Total Work Load</b>			<b>150</b>
<b>Total Work Load / 25 (hours)</b>			<b>6.00</b>
<b>ECTS</b>			<b>6.00</b>