Discipline	Operating Systems Principles code: 26 5 semester – winter	
Specialty	SOFTWARE AND INTERNET TECHNOLOGIES	
ECTS credits: **6**	Form of assessment: exam	
Lecturer	Professor, Ph.D Hristo Valchanov Room 207-4E Phone: +359 052 383 439 E-mail: hristo@tu-varna.bg	
Department	Computer Science and Engineering	
Faculty	Faculty of Computing and Automation	

Learning objectives:

The subject acquaints the students with the basic principles of modern operating systems. Structure of operating systems is explained, functions of the individual components are described. Particular attention is paid to the parallel operation of processes, providing multitasking and multiuser work in any modern operating system. The problems that arise with simultaneous access of multiple processes to shared resources are presented. Classical methods and algorithms are addressed to solve these problems.

The laboratory exercises demonstrate the workings of the main components of the operating system - basic commands, work with the command interpreter, the file system. Particular attention is paid to the means and algorithms for solving the problem of competitive access of parallel processes to common resources. The laboratory exercises are under Linux operating system.

CONTENTS:		
Training Area	Hours lectures	Hours seminar exercises

Operating systems - principles. Structure and functions of OS	2	
Processes. States of processes. Work of parallel processes	2	
Processes and Threads. Multithreading	2	
Critical Sections. Mutual exclusion of parallel processes to shared resources	4	
Mutexes, semaphores and monitors	2	
Process scheduling. Scheduling algorithms	2	
Organization and management of memory	2	
Paging. Segmentation	2	
Virtual memory. Swapping	2	
File system. File operations. Directories	4	
File system implementation	2	
Computer security. Access control	2	
Virtualization	2	
Introduction to Linux. Basic commands		2
Files and directories		2
Creating scripts under Linus		4
Separate compilation		2
Processes in Linux		2
Access to shared resources		4
Synchronization of parallel processes. Test and set		2
Synchronization of parallel processes. Semaphores		4
Creating of multithread programs		4
Threads synchronization		2
File programming		2
TOTAL: 60 h	**30**	**30**