COURSE SYLLABUS AND COURSE REQUIREMENTS
ACADEMIC YEAR 2025/2026 SEMESTER 2

Course title	***Operating Systems***
Course Code	**IVB186ANMI**
Hours/Week: le/pr/lab	***2/0/2***
Credits	***4***
Degree Programme	***Computer Science Engineering BSc***
Study Mode	***Full time***
Requirements	***Final examination***
Teaching Period	***2025/2026-2***
Prerequisites	
Department(s)	***System and Software Technologies***
Course Director	***Péter IVÁNYI***
Teaching Staff	***Péter NOVÁK***

COURSE DESCRIPTION

A short description of the course (max. 10 sentences).
Neptun: Instruction/Subjects/Subject Details/Basic data/Subject description

To learn the working principles of operating systems serves as a base for understanding the concept of multi-programming, the workings and isolation of processes and the accounting and management functions of an operating system. Acquiring this knowledge is an important milestone for other subjects, like for e.g. understanding some programming paradigms, or server operations and maintenance.

SYLLABUS

Neptun: Instruction/Subjects/Subject Details/Syllabus

1. GOALS AND OBJECTIVES

Goals, student learning outcome.
Neptun: Instruction/Subjects/Subject Details/Syllabus/Goal of Instruction

To learn the working principles of operating systems serves as a base for understanding the concept of multi-programming, the workings and isolation of processes and the accounting and management functions of an operating system. Acquiring this knowledge is an important milestone for other subjects, like for e.g. understanding some programming paradigms, or server operations and maintenance.

2. COURSE CONTENT

Neptun: Instruction/Subjects/Subject Details/Syllabus/Subject content

	TOPICS
LECTURE	*1. topic* *2. topic* *3. topic* *4. etc.*
PRACTICE	*1. topic* *2. topic*

	3. *topic* 4. *etc.*
LABORATORY PRACTICE	1. *topic* 2. *topic* 3. *topic* 4. *etc.*

DETAILED SYLLABUS AND COURSE SCHEDULE

ACADEMIC HOLIDAYS INCLUDED

LECTURE

week	**Topic**	**Compulsory reading; page number (from ... to ...)**	**Required tasks (assignments, tests, etc.)**	**Completion date, due date**
1.	Course introduction, schedule and requirements.		...	...
2.	Definition and history of operating systems. OS abstraction schemes.	[1.] 1.1, 1.3, 1.5, 1.7		
3.	Processes, process states. Task switching, interrupts. Memory isolation. HW privilege rings.	[1.] 1.6, 2.1-2.2		
4.	Processes vs threads. The system call interface. Disk and filesystems.	[1.] 1.6, 2.1-2.2		
5.	File allocation algorithms. Directory implementations. Ext4 and NTFS details. Advanced FS functions.	[1.] 4.1-4.4, 5.4		
6.	Disk head positioning algorithms, disk scheduling, performance improvements. RAID technologies.	[1.] 4.1-4.4, 5.4		
7.	Memory allocation algorithms. Memory abstraction, segmentation and paging.	[1.] 3.1-3.7		
8.	Page faults, swapping, page replacements algorithms.	[1.] 3.1-3.7		
9.	Spring break			
10.	IPC problems, synchronization primitives, MPI.	[1.] 2.3-2.5		
11.	Process scheduling algorithms. Linux scheduling policies.	[1.] 2.3-2.5		
12.	Input/Output, IRQ, DMA.	[1.] 5.1--5.3		
13.	Virtualization.	[1.] 7.1-7.9		
14.	Deadlock detection and management.	[1.] 6.1-6.2, 6.4-6.6		
15.	Summary, exam know-how.			

PRACTICE, LABORATORY PRACTICE

week	**Topic**	**Compulsory reading; page number (from ... to ...)**	**Required tasks (assignments, tests, etc.)**	**Completion date, due date**

1.	Introduction to the lab environment.			
2.	Terminals, shells, standard streams pipes.			
3.	Standard Linux directory structure, file-centric concepts in Linux, special files, file operations.			
4.	Managing processes and jobs.			
5.	Viewing/editing/finding files. Hardlinks and symlinks.			
6.	Users and groups, passwords. Password aging.			
7.	Posix file permissions, su, sudo			
8.	Block devices, MBR partitioning scheme. Swap management.			
9.	Spring break			
10.	Create, mount, repair, resize filesystems. Analyze disk usage.			
11.	Package management, distributions, repositories.			
12.	Boot procedure, GRUB, systemd, init.			
13.	Virtualization.			
14.	Practice exam			
15.	Summary, exam know-how			

3. ASSESSMENT AND EVALUATION

(Neptun: Instruction/Subjects/Subject Details/Syllabus/Examination and Evaluation System)

ATTENDANCE

In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.

Method for monitoring attendance *(e.g.: attendance sheet / online test/ register, etc.)*

attendance sheet

ASSESSMENT

Cells of the appropriate type of requirement is to be filled out (course-units resulting in mid-term grade or examination). Cells of the other type can be deleted.

Course-unit with final examination

Requirements for the end-of-semester signature

(Eg.: mid-term assessment of 40%)

- Theoretical part: Pass the mid-term 5 mini tests with a minimum of 40% performance average (week 3,5,7,10,13). Retake on week 15.

- Practical part: Pass the practical test (week 14) with min. 40%. Retake only for those who reach min. 25%. Retakes on week 15 and on the 1st week of the exam period.

Re-takes for the end-of-semester signature (PTE TVSz 50§(2))

The specific regulations for grade betterment and re-take must be read and applied according to the general Code of Studies and Examinations. E.g.: all the tests and the records to be submitted can be repeated/improved each at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.

See: requirements for the end-of-semester signature

Type of examination *(written, oral): written.*

The exam is successful if the result is minimum ***40*** ***%.*** *(The minimum cannot exceed 40%.)*

Calculation of the grade *(TVSz 47§ (3))*

The mid-term performance accounts for ***0*** %, the performance at the exam accounts for ***100*** % in the calculation of the final grade.

Calculation of the final grade based on aggregate performance in percentage.

Course grade	Performance in %
excellent (5)	85 % ...
good (4)	70 % ... 85 %
satisfactory (3)	55 % ... 70 %
pass (2)	40 % ... 55 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

4. SPECIFIED LITERATURE

In order of relevance. (In Neptun ES: Instruction/Subject/Subject details/Syllabus/Literature)

COMPULSORY READING AND AVAILABILITY

[1.] Andrew S. TANENBAUM: Modern Operating Systems; ISBN 9780136006633

RECOMMENDED LITERATURE AND AVAILABILITY

[2.] Thomas ANDERSON, Michael DAHLIN: Operating Systems, Priciples and Practice; ISBN 9780985673529

[3.] David A. SOLOMON: Windows Internals 7th Edition; ISBN 9780735684188

[4.] SILBERSCHATZ, GALVIN, GAGNE: Operating systems concepts; ISBN 9780470128725