

COURSE SYLLABUS AND COURSE REQUIREMENTS

ACADEMIC YEAR 2024/2025... SEMESTER I. ...

<i>Course title</i>	Computer Architectures
<i>Course Code</i>	IVB062AN
<i>Hours/Week: le/pr/lab</i>	2/0/0
<i>Credits</i>	4
<i>Degree Programme</i>	IT Engineering BSC
<i>Study Mode</i>	
<i>Requirements</i>	
<i>Teaching Period</i>	Sep. 2 th - May. 16 th
<i>Prerequisites</i>	
<i>Department(s)</i>	System and Software Technologies
<i>Course Director/ Teaching Staff</i>	Géza Várady

COURSE DESCRIPTION

A short description of the course (max. 10 sentences).

Neptun: Instruction/Subjects/Subject Details/Basic data/Subject description

The Computer Architectures course covers the theoretical and practical operation and architecture of computers. In addition to the main components, it introduces the operation and management of the peripherals, the architecture of the computer, including the CPU, its structure and operation, and optimisation options. By showing the relationship between low-level hardware layers and high-level programming, the entire computer operation becomes clear to understand.

Neptun: Instruction/Subjects/Subject Details/Syllabus

1. GOALS AND OBJECTIVES

Goals, student learning outcome.

Neptun: Instruction/Subjects/Subject Details/Syllabus/Goal of Instruction

This course follows the logic of the structured design of computers, looking at the circuits built from transistors and their functions, as well as the internal design of the processor. The software and hardware support of parallel systems, the assembly-level programming process, all form a good basis for further and parallel subjects. Parallel architectures also prepares the students for the later parallel programming techniques studied at MSc level. It also covers the hardware solutions to the functionality covered in the Operating Systems course.

2. COURSE CONTENT

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

TOPICS

LECTURE	TOPICS
	<ol style="list-style-type: none"> 1. Computer history, classification 2. Basic operation of computers, parallelisation options 3. How hard disks work, HAMR, RAID 4. Digital logic level overview, bus systems, memories 5. microarchitecture level, JVM Mic-1 6. microarchitecture level, Mic-2 7. microarchitecture level, Mic-3 8. microarchitecture level, Mic-4 9. SPRING BREAK 10. cache accelerators, cache strategies 11. branch prediction 12. out of order execution 13. ISA level, instructions, data types 14. IA-64 architecture advantages

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.	Computer history, classification	2-36		
2.	Basic operation of computers, parallelisation options	52-65		week 1
3.	How hard disks work, HAMR, RAID	81-86		week 2
4.	Digital logic level overview, bus systems, memories	125-187		week 3
5.	Microarchitecture level, IJVM Mic-1	243-290		week 4
6.	Microarchitecture level, Mic-2	291-293		week 5
7.	Microarchitecture level, Mic-3	294-300		week 6
8.	Microarchitecture level, Mic-4	300-303		week 7
9.	Caches, strategies	303-310		week 8
10.	Branch prediction	310-315		week 9
11.	Out-of-order execution	315-323		week 10
12.	ISA level, Instructions	345-358		week 11
13.	ISA level, data types	358-362		week 12
14.	IA-64 architecture advantages			week 13
15.				

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.)

Attending is not required but is strongly recommended. Preparation for the exams can be done according to the handout slides and the reference materials. The course is part of the state exam for students.

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 resulting in mid-term grade (PTE TVSz 40§(3))

Mid-term assessments, performance evaluation and their ratio in the final grade (The samples in the table to be deleted.)

Type	Assessment	Ratio in the final grade
Possible pre-exam on last week for proposed mark (3+)	written exam	

Opportunity and procedure for re-takes (PTE TVSz 47§(4))

The specific regulations for improving grades and resitting tests must be read and applied according to the general Code of Studies and Examinations. E.g.: all tests and assessment tasks can be repeated/improved 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.

One pre-exam, everything after that are normal exams

Grade calculation as a percentage

based on the aggregate performance according to the following table

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.

Course-unit with final examination

Mid-term assessments, performance evaluation and their weighting as a pre-requisite for taking the final exam

(The samples in the table to be deleted.)

Type	Assessment	Weighting as a proportion of the pre-requisite for taking the exam
1. Written exam during exam period	Written exam	last exam mark is the final mark

Requirements for the end-of-semester signature

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

Attendance at classes.

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.

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 a possible proposed mark. The performance at the final exam accounts for 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.] AS Tanenbaum, Structured Computer Organization, PEARSON

RECOMMENDED LITERATURE AND AVAILABILITY

[2.] JL Hennessy, DA Patterson, Computer Architecture a quantitative approach, Elsevier, Morgan Kaufmann