

Schedule

Computer architectures

Subject code : GEIAL301-B2a

Major : computer science engineer, business informatics specialist, computer science program designer .

Type : required

Instructor, lecturer : Dr. Szilveszter Kovács

Subject manager : Dr. Szilveszter Kovács

Semester : Fall 2025/2026

Seven Theory

Practices

- | Seven Theory | Practices |
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| 1. Computational models. Objectives of the subject, requirements for completion. Computer history. Computer architectures. Neumann-type machine, data stream machine. | Getting to know the laboratories and the conditions. Requesting account numbers. |
| 2. User perspectives. Command and response languages, tools and files , directory concepts, nodes and services, users and access. | Linux login, password change. Practicing some commands. |
| 3. Educational break | Unix shell usage. Mail, ftp, browsing. |
| 4. User interfaces. Bourne shell (sh). Important commands. Stream redirection. File name and command output substitution. | Practicing shell commands. Search engines on the WEB. Collecting material about the CPU. |
| 5. The processor (CPU). Its functional elements. ALU, registers, control unit, bus manager. Instruction set. Addressing modes. Processor performance and measurement. | Practicing shell commands. Search engines on the WEB. Collecting material about the CPU. |
| 6. Performance enhancement. Increasing processor performance. CISC and RISC concept . Internal parallelizations: pipeline and superscalarity . Speculative execution. | Practicing shell commands. Shell script. |
| 7. Educational break | Educational break |
| 8. Buses. Bus transactions. Bus performance. Control methods. "Famous" Buses. | Educational break |

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| 9. | Memory. Semiconductor storage devices. RAM, DRAM, SDRAM, ROM, PROM, EPROM, EEPROM, SRAM. Memory modules. The principle of locality, caches . | Practicing shell commands.
Shell script. |
| 10 . | Devices. Controllers. Interrupts. Magnetic storage devices. The CD and DVD. | Shell commands practice.
Shell script. AWK. |
| 11. | Devices. Screens CRT and LCD. Keyboard. Pointers. Printers (inkjet and laser). | Shell commands practice.
Shell script. AWK. |
| 12. | Modern architectures. Case studies. | Shell commands practice.
Shell script. AWK. |
| 13. | Mid-semester written test. | Reports. |
| 14. | Practical questions. | Reports. |

Required reading

- Lecture notes available on Szilveszter Kovács's website (www.iit.uni-miskolc.hu/~szkovacs)

Recommended reading

- A. S. Tanenbaum: Structured Computer Organization, 2005, ISBN:978-0-13-148521-1,
<https://csc-knu.github.io/sys-prog/books/Andrew%20S.%20Tanenbaum%20-%20Structured%20Computer%20Organization.pdf>

How to close the object:

- Signature, exam

Mid-semester review:

- *Two mid-semester assignments given during the exercises.*
- *Mid-semester written test, which falls on the penultimate week of study. The closed-door paper lasts 50 minutes and requires a score of at least 50% to pass.*

Conditions for obtaining the signature:

- *active participation in the exercises . The exercise leader evaluates each student at each exercise and determines whether or not the exercise is considered completed.*
- *To sign, you must complete at least 10 exercises. Absences due to illness must also be made up.*
- *An additional condition for signing is the successful completion of the mid-semester assignments and the successful completion of the mid-semester written test.*

Replacement options:

- *Exercises, individual assignments and papers in the lock-up period can be made up once, and individual (or combined) replacements can take place no later than the last week of the academic period, based on Section 38(5) of Volume III of the University of Miskolc Regulations. The additional defense of assignments entails missing the deadline, therefore a special procedure fee must be paid.*
- *It is no longer possible to make up for missing signatures due to missed exercises and mid-year assignments during the exam period.*

Exam format:

- Written and oral.

After the written part has been completed at least satisfactorily, the oral part follows. Evaluation of the written and oral parts:

0%-50 % :	insufficient
51%-62 % :	sufficient
63%-75 % :	medium
76%-88 % :	good
89%-100 % :	distinguished

The resulting performance is determined by the formula $0.667 \cdot \text{written} + 0.333 \cdot \text{verbal}$, to which a grade is assigned according to the given table.

An insufficient written or insufficient oral exam grade means an insufficient exam grade. Attendance at the oral exam is mandatory. A student who participated in the written part but did not attend the oral exam will receive a "Did not attend" Neptun entry.

The examining instructor has the right – for control purposes – to ask the student to repeat orally some of the questions in the written paper.

General provisions:

the University of Miskolc Regulations, the use of unauthorized aids (scattering) or the presentation of someone else's work as one's own (plagiarism) during all subject-related assessment events is considered a disciplinary offense, which results in academic sanctions or disciplinary proceedings.

An academic sanction for mid-year examinations is the grading of the examination as unsuccessful. The examination cannot be made up in such cases. An academic sanction during the examination period is an insufficient grade for the exam, and the student may take a repeat exam at a time designated by the department, before a designated examination committee, in the form of an oral exam.

The department records the fact of cheating and/or plagiarism during the student's period of study, and in the event of a repeated occurrence, it initiates disciplinary proceedings as prescribed in Section 96 of Volume III of the University of Miskolc Regulations.

Miskolc, September 2025.

Dr. Szilveszter Kovacs