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| **Óbuda University**<br>John von Neumann Faculty of Informatics | | | Institute for Cyber-Physical Systems | |
| **Name and code:** NIESA1EBNE Introduction to Computer Architectures **Credits*: 4***<br><br>*Computer Science and Engineering BSc programme* *2022/23 year I. semester* | | | | |
| | | | | |
| Subject lecturers: Zsolt Bringye, Levente Durczy | | | | |
| Prerequisites (with code): | | | | |
| Weekly hours: | Lecture: 2 | Seminar.: 0 | Lab. hours: 0 | Consultation: 0 |
| Way of assessment: | exam | | | |
| **Course description:** | | | | |
| *Goal*: The goal of the subject is to provide an overview on computer architectures | | | | |
| *Course description:* The notion of computational models and computer architectures, most important computational models, the von-Neumann computational model, computer organization, the main elements of computers, interconnections | | | | |

| **Lecture schedule** | |
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| *Education week* | *Topic* |
| 1. | Computer architecture and Computer organization, generic view of modern computers |
| 2. | Computational models, computer architectures and programming languages, examples |
| 3. | Computational models, computer architectures and programming languages, examples |
| 4. | The von-Neumann computational model |
| 5. | Instruction Set Architectures, design space of the ISA |
| 6. | Representation of numbers, Fix point and floating-point arithmetic |
| 7. | ISA extensions |
| 8. | Computer Interconnections (from buses to point-to-point interconnects) |
| 9. | Computer memories |
| 10. | Cache memories, cache levels, addressing |
| 11. | I/O models, Interrupt driven I/O, DMA |
| 12. | Quantitative characteristic of computers, Performance: bandwidth vs latency, improvement rate of them (and its consequences) |

| **Midterm requirements** |
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| none |

**Final grade calculation methods**

| Achieved result | Grade |
|---|---|
| 86%-100% | excellent (5) |
| 74%-85<% | good (4) |
| 62%-73<% | average (3) |
| 50%-61<% | satisfactory (2) |
| 0%-49<% | failed (1) |

**Type of exam**

Written exam

**Type of replacement**

**References**

Mandatory:
Lecture notes (download form https://elearning.uni-obuda.hu/)

Recommended:
Advanced Computer Architectures by D. Sima, T. Fountain and P. Kacsuk
Computer Architecture by J.L. Henessy and D. A. Patterson
Computer Organization and architecture by W. Stallings