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| Obuda University John von Neumann Faculty of Informatics | | Institute for Cyber-physical Systems | | |
| Name and code: <i>Advanced Computer Architectures (NIXKA1EBNE)</i> Credits: 2 | | | | |
| <i>Computer Science and Engineering BSc programme</i> | | | <i>2019/20 year II. semester</i> | |
| Subject lecturers: Zsolt <u>Bringye</u> | | | | |
| Prerequisites (with code): | | | | |
| Weekly hours: 2 | Lecture: 2 | Seminar.: 0 | Lab. hours: 0 | Consultation: 0 |
| Way of assessment: | written exam | | | |
| Course description: | | | | |
| <i>Goal:</i> During the semester the students get to know the design and implementation possibilities of the CPU and GPU level parallel program execution. | | | | |
| <i>Course description:</i> | | | | |
| <u>Topics covered in lecture</u> | | | | |
| <ul style="list-style-type: none">• Designing a single cycle and a multicycle processor• Functional parallelism• Data parallelism• Classification of parallel architectures• Basic parallel techniques• Vector architectures• SIMD ISA extensions• GPUs• Multiprocessor systems (incl. cache coherency and heterogenous systems)• Motherboards, parts of motherboards | | | | |
| <u>Homework (optional)</u> | | | | |
| To give a deeper understanding of the material the students allowed to form groups of two and create a homework project during the semester which they will present at the end of the semester. | | | | |

| Lecture schedule | |
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| <i>Education week</i> | <i>Topic</i> |
| 1. | |
| 2. | A short review (topics from the previous semester) |
| 3. | Designing a single cycle processor |
| 4. | Designing a multicycle processor |
| 5. | Types of parallelism, classification of parallel architectures |
| 6. | Basic parallel techniques |
| 7. | Basic parallel techniques (contd.) |
| 8. | Vector architectures |
| 9. | Break |
| 10. | SIMD ISA extensions, GPUs |
| 11. | Multiprocessor systems |
| 12. | Multiprocessor systems (contd.) |
| 13. | Motherboards |
| 14. | Presentation of homework |
| Midterm requirements | |

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| Type of exam |
| <p>Written exam. The final score consist of:</p> <ul style="list-style-type: none"> the score of the exam (up to 100 points) optionally the score of the presentation (up to 20 points) <p>The requirement of the pass mark is 51 points.</p> |
| Type of replacement |
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| References |
| <p>Mandatory: See in the e-learning system.</p> <p>Recommended:</p> <ul style="list-style-type: none"> Advanced Computer Architectures by D. Sima, T. Fountain and P. Kacsuk Computer Architecture by J.L. Henessy and D. A. Patterson Digital Design and Computer Architecture by S. L. Harris and D. M. Harris |