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| 1. | Course title | Computer Architecture and Organization | | |
| 2. | Course code | | | |
| 3. | Study program | | | |
| 4. | Unit offering the course | **FCSE** | | |
| 5. | Undergraduate/postgraduate/PhD | **Undergraduate** | | |
| 6. | Year/semester<br>1/Summer/mandatory | 7. ECTS: **6** | | |
| 8. | Teacher(s) | Marjan Gusev, Dimitar Trajanov, Anastas Misev, Ljupco Antovski, Dejan Spasov, Sonja Filiposka, Igor Trajanovski, Igor Miskovski | | |
| 9. | Course prerequisites | n/a | | |
| 10. | Goals (competences):<br>Understanding main computer architectures, estimating performance of individual parts as well as the computer system as a whole. | | | |
| 11. | Course content:<br>Introduction to computer systems. Overview of computer architectures and processing structures. Capacity and performance of computer systems. Machine representation of numbers and characters. Arithmetic algorithms. Organization of arithmetic-logic unit. Instruction formats. Processing of instructions and operations. Dataflow design techniques, Multifunctional units. Virtual machines. Virtual memory. Use of main memory. Parameters in memory systems. Typical memory organizations. Types of IO networks. Real IO schemes. External memory devices. Disks. | | | |
| 12. | Teaching methods:<br>Lectures with slide presentations, interactive lectures, exercises (using equipment and software packages), team work, use cases, guest lectures, individual work and project defence, online collaboration tools. | | | |
| 13. | Total available time | 6 ECTS x 30 hours = 180 hours | | |
| 14. | Distribution of the available time | | | |
| 15. | Teaching activities | 15.1. | Lectures | 45 hours |
| | | 15.2. | Training (labs, problem solving), seminar and team work | 65 hours |
| 16. | Other activities | 16.1. | Project work | 20 hours |
| | | 16.2. | Self study | 20 hours |
| | | 16.3. | Home work | 30 hours |
| 17. | Grading | | | |
| | 17.1. | Tests | | 47 points |
| | 17.2. | Seminar work/project (written or oral presentation) | | 33 points |
| | 17.3. | Active participation | | 20 points |
| 18. | Grading criteria | | upto 49 points | 5 (five) (F) |

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|---|---|---|---|---|---|---|
| | | | | from 50 to 59 points | 6 (six) (E) | |
| | | | | from 60 to 69 points | 7 (seven) (D) | |
| | | | | from 70 to 79 points | 8 (eight) (C) | |
| | | | | from 80 to 89 points | 9 (nine) (B) | |
| | | | | from 90 to 100 points | 10 (ten) (A) | |
| 19. | Final exam prerequisites | | | completed activities 15.1 and 15.2 | | |
| 20. | Course language | | | Macedonian and English | | |
| 21. | Quality assurance methods | | | internal evaluation and surveys | | |
| 22. | Literature | | | | | |
| | 22.1. | Compulsory | | | | |
| | | No. | Authors | Title | Publisher | Year |
| | | 1. | Hennessy & Patterson | Computer Organization and Design | Просветно дело, (Morgan Kaufmann) | 2011 |
| | | 2. | Hennessy & Patterson | Computer Architecture: A Quantity Approach, 3rd ed | Morgan Kaufmann | 2007 |
| | | 3. | M. Morris Mano | Digital Design, 4th ed | Prentice Hall | 2005 |
| | 22.2. | Mandatory | | | | |
| | | No. | Authors | Title | Publisher | Year |
| | | 1. | W. Stallings | Computer Organization and Architecture, 7th ed | Prentice Hall | 2005 |
| | | 2. | | | | |
| | | 3. | | | | |