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| 1. | Course title | **VLSI Design** | | |
| 2. | Course code | SOCD-I-06 | | |
| 3. | Study program | **System on Chip Design** | | |
| 4. | Unit offering the course | **FCSE** | | |
| 5. | Undergraduate/master/PhD | **Master** | | |
| 6. | Year/semester 1(2)/summer/elective | 7. ECTS: **6** | | |
| 8. | Teacher(s) | Assist. Prof. Lasko Basnarkov | | |
| 9. | Course prerequisites | None | | |
| 10. | Goals (competences):<br>After successfully completing the course, the student is expected to be able to design specific VLSI circuit blocks, analyse the influence of the connections on the VLSI circuit performances, analyse the signalling and timing circuits. | | | |
| 11. | Course content:<br>Basic circuit level principles and models. Semiconductor circuits and wiring. Production process and VLSI scaling trends. Elementary building blocks – ports, flip-flops, three-state buffers, memory cells, etc. Outlook. Timing characteristics. Dimensioning. Sutherland and Sproull. Connections: capacitive, inductive, resistive parasites. Signalling and circuits conventions. Timing and circuits conventions. | | | |
| 12. | Teaching methods:<br>Lectures supported by slide presentations, interactive lectures, trainings (using lab equipment and software packages), team work, case studies, invited guests and lectures, individual practical assignments presentations, seminar paper, e-learning (forums, consultations). | | | |
| 13. | Total available time | 6 ECTS x 30 hours = 180 hours | | |
| 14. | Distribution of the available time | 30 + 15 + 135 = 180 hours | | |
| 15. | Teaching activities | 15.1. | Lectures | 30 hours |
| | | 15.2. | Training (labs, problem solving), seminar and team work | 15 hours |
| 16. | Other activities | 16.1. | Project work | 60 hours |
| | | 16.2. | Self study | 25 hours |
| | | 16.3. | Home work | 50 hours |
| 17. | Grading | | | |
| | 17.1. | Tests | | 75 points |
| | 17.2. | Seminar work/project (written or oral presentation) | | 15 points |
| | 17.3. | Active participation | | 10 points |
| 18. | Grading criteria | to 59 points | | 5 (five) (F) |
| | | from 60 to 68 points | | 6 (six) (E) |
| | | from 69 to 76 points | | 7 (seven) (D) |
| | | from 77 to 84 points | | 8 (eight) (C) |

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| | | | | from 85 to 92 points | | 9 (nine) (B) |
| | | | | from 93 to 100 points | | 10 (ten) (A) |
| 19. | Final exam prerequisites | | | Successfully completed activities 15.1 and 15.2 | | |
| 20. | Course language | | | Macedonian and English | | |
| 21. | Quality assurance methods | | | Internal evaluation and student questionnaires | | |
| 22. | Literature | | | | | |
| | 22.1. | Compulsory | | | | |
| | | No. | Authors | Title | Publisher | Year |
| | | 1. | Wayne Wolf | Modern VLSI Design: IP-Based Design (4th Edition) | Prentice Hall | 2008 |
| | | 2. | Yuan Taur | Fundamentals of Modern VLSI Devices | Cambridge University Press | 1998 |
| | | 3. | | | | |
| | 22.2. | Additional | | | | |
| | | No. | Authors | Title | Publisher | Year |
| | | 1. | | | | |
| | | 2. | | | | |
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