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| 1. | Course title | **Advanced methods in data mining** | | |
| 2. | Course code | InIS-I-02 | | |
| 3. | Study program | **Engendering of intelligent systems** | | |
| 4. | Unit offering the course | **FCSE** | | |
| 5. | Undergraduate/master/PhD | **Master** | | |
| 6. | Year/semester<br>2/winter/compulsory | 7. ECTS: **6** | | |
| 8. | Teacher(s) | Prof. d-r Zaneta Popeska, prof. d-r Ana Madevska-Bogdanova | | |
| 9. | Course prerequisites | Basic course in data mining | | |
| 10. | Goals (competences): Acquiring extended knowledge in the area of data mining and discovering rules and information in large data basis, as well as their application in specific data basis. | | | |
| 11. | Course content: Advanced techniques in discovering schemes and patterns in multiyear and multidimensional data spaces. Discovering frequent forms with restrictions. Mining through high dimensional data and colossal schemes. Research of schemes and patterns and application. Advanced methods for classification. Bayesian nets. Classification by back propagation. Supported vector machines. Classification using frequent patterns. Clustering based on probabilistic models. Clustering of high dimensional data. Clustering of graphs and data nets. Clustering with restrictions. Discovering and analyzing outliers. | | | |
| 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 + 30+40+40+40 = 180 hours | | |
| 15. | Teaching activities | 15.1. | Lectures | 30 hours |
| | | 15.2. | Training (labs, problem solving), seminar and team work | 30 hours |
| 16. | Other activities | 16.1. | Project work | 40 hours |
| | | 16.2. | Self study | 40 hours |
| | | 16.3. | Home work | 40 hours |
| 17. | Grading | | | |
| | 17.1. | Tests | | 40 points |
| | 17.2. | Seminar work/project (written or oral presentation) | | 60 points |
| | 17.3. | Active participation | | |
| 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) |

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| | | | | from 77 to 84 points | 8 (eight) (C) | |
| | | | | 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. | Jiawei Han, Micheline Kamber, Jian Pei | Data Mining Concepts and Techniques, Third edition | Elsevier | 2012 |
| | | 2. | Witten, Frank | Data Mining practical machine learning tools and techniques | Elsevier | 2005 |
| | | 3. | David L. Olson, Dursum Delen | Advanced Data mining Techniques | Springer-Verlag | 2008 |
| | 22.2. | Additional | | | | |
| | | No. | Authors | Title | Publisher | Year |
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