

FIȘA DISCIPLINEI

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| Denumirea disciplinei : | | MACHINE LEARNING | | | |
| Codul disciplinei: | | | | | |
| Programul de studii: | | Embedded Systems - Master | | | |
| Catedra: | | Computer Science and Automatic Control | | | |
| Facultatea: | | "Hermann Oberth" Engineering Faculty | | | |
| Universitatea: | | „Lucian Blaga” University of Sibiu | | | |
| Anul de studiu: | 1 | Semestrul | 2 | Tipul de evaluare finală | E+V |
| Regimul disciplinei (DI=obligatorie/ DO=opțională/DF=liber aleasă): | | | DI | Numărul de credite: | 8+2 |
| Categorია formativă a disciplinei (DF=fundamentală.; DI=ingineresti; DS=specialitate; DC=complementară) | | | | | DS |
| Total ore din planul de învățământ | 56+14 | | | Total ore pe semestru: | 70 |
| Titularul disciplinei: Prof. Dr. Ing. Daniel VOLOVICI | | | | | |

| Numărul total de ore (pe semestru) din planul de învățământ | | | | | |
|---|----|---|----|----|-------|
| Total ore/ semestru | C | S | L | P | Total |
| | 42 | | 14 | 14 | 70 |

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| Obiective: | <p>The goal of this course is to present the key algorithms and theory that form the core of machine learning. It introduces basic concepts from statistics, artificial intelligence, information theory, and other disciplines as the need arises, focusing on just those concepts most relevant to machine learning.</p> <p>Bringing up to date of the program will be achieved periodically in concordance with domain developing and with study programs of the prestigious universities of the world.</p> |
| Competențe specifice disciplinei | <p>1. Knowledge and understanding:</p> <ul style="list-style-type: none"> • Knowledge and understanding the general principles for the subject • Knowledge and work adequately with notions • Attainment capacity for integrate obtained knowledge from others classes • Identity the main information sources <p>2. Explication and interpretation:</p> <ul style="list-style-type: none"> • Critical analysis form theoretical models, ideas and usually used broach. • Capacity to realized a concrete project and a afferent report • Develop ability of individually research <p>3. Instrumental – aplicative</p> <ul style="list-style-type: none"> • Knowledge and working with usually used tools • Designed and projection at different level of abstraction • Using several strategies, methods, techniques of implementation and evaluating in the developed process. |

4. Atitudinale:

- Integration for working into a team at a large projects
- Stimulation moral attitude and fairness in evaluating and auto evaluating.
- Appreciation of work into a team and a work of each member from the team.
- Responsibility vis a vis of team results

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| Conținutul tematic (descriptori) | Analytical program of the course | | |
| | Nr. crt. | Name | Nr. ore |
| | 1. | Introduction. Neural Network classification. | 3 |
| | 2. | Concept Learning | 3 |
| | 3. | Decision Tree Learning | 3 |
| | 4. | Artificial Neural Networks | 3 |
| | 5. | Evaluating Hypotheses | 3 |
| | 6. | Bayesian Learning | 6 |
| | 7. | Computational Learning Theory | 3 |
| | 8. | Instance-Based Learning | 3 |
| | 9. | Genetic Algorithms | 3 |
| | 10. | Learning Sets of Rules | 3 |
| | 11. | Analytical Learning | 3 |
| | 12. | Combining Inductive and Analytical Learning | 3 |
| | 13. | Reinforcement Learning | 3 |
| | Analytical program of laboratory and project | | |
| | 1. | FIND-S Algorithm | 4 |
| | 2. | LIST-THEN-ELIMINATE Algorithm | 4 |
| | 3. | CANDIDATE-ELIMINATION Learning Algorithm | 4 |
| | 4. | Basic Decision Tree Learning Algorithm | 4 |
| 5. | Sequential Covering Algorithms | 4 | |
| 6. | BACKPROPAGATION Algorithm | 4 | |
| 7. | KBANN Algorithm | 4 | |

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| Metode de predare / seminarizare | Lecture, problems, disquisition, drills, debates and conversation |
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| Stabilirea notei finale (procentaje) | - Final exam | 50 |
| | - Activity developed at laboratory | 15 |
| | - Activity developed at project | 20 |
| | - Homework | 10 |
| | - other activities (classes presence) | 5 |
| | - TOTAL | 100% |

Final evaluation is made based on final exam that contains maximum 40% theory and 60% resolving from theoretically point of view a given problem.

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| Requirement for note 5 Knowing based notions form machine learning domain. Understanding elementary notions from learning theory. | Requirement for note 10 Capacity to reproduce and demonstrate deepens knowledge at discipline level after evaluating. |
| TOTAL ore studiu individual (pe semestru) = 63 | |

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| Bibliografia | Minimală obligatorie: <ul style="list-style-type: none"> • Tom M. Mitchell – „Machine Learning”, McGraw-Hill, 1997; • Stuart Russel, Peter Norvig – „Artificial Intelligence: a modern approach”, Prentice-Hall, 1995; |
| | Complementară: <ul style="list-style-type: none"> • Luger, G. F., Stubblefield, W. A., - „Artificial Intelligence”, Addison Wesley Longman, Third Edition, 1998; • Ian, H., Witten, E. F., - „Data Mining, Practical Machine Learning Tools and Techniques with Java implementation”, Morgan Kaufmann, 2000; |
| List of didactical material used in teaching process: <ul style="list-style-type: none"> - Computer networks - internet - access at bibliography | |

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| Discipline titular | Grad didactic, titlul, prenume, numele | Semnătura |
| | Prof. Dr. Ing. Daniel VOLOVICI | |