

SYLLABUS

1. Information regarding the programme

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| 1.1 Higher education institution | Babeş Bolyai University |
| 1.2 Faculty | Faculty of Mathematics and Computer Science |
| 1.3 Department | Department of Computer Science |
| 1.4 Field of study | Computer Science |
| 1.5 Study cycle | Master |
| 1.6 Study programme / Qualification | Component-Based Programming |

2. Information regarding the discipline

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|----------------------------|--|--------------|----------|-------------------------|----------|------------------------|-------------------|
| 2.1 Name of the discipline | Decision Support Systems | | | | | | |
| 2.2 Course coordinator | Lecturer Professor PhD. Prejmerean Vasile | | | | | | |
| 2.3 Seminar coordinator | Lecturer Professor PhD. Prejmerean Vasile | | | | | | |
| 2.4. Year of study | 2 | 2.5 Semester | 3 | 2.6. Type of evaluation | E | 2.7 Type of discipline | Compulsory |

3. Total estimated time (hours/semester of didactic activities)

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|---|------------|----------------------|-----------|------------------------|---------------|
| 3.1 Hours per week | 3 | Of which: 3.2 course | 2 | 3.3 seminar/laboratory | 1 / - |
| 3.4 Total hours in the curriculum | 42 | Of which: 3.5 course | 28 | 3.6 seminar/laboratory | 14 / - |
| Time allotment: | | | | | hours |
| Learning using manual, course support, bibliography, course notes | | | | | 28 |
| Additional documentation (in libraries, on electronic platforms, field documentation) | | | | | 36 |
| Preparation for seminars/labs, homework, papers, portfolios and essays | | | | | 36 |
| Tutorship | | | | | 20 |
| Evaluations | | | | | 24 |
| Other activities: Project | | | | | 14 |
| 3.7 Total individual study hours | 158 | | | | |
| 3.8 Total hours per semester | 200 | | | | |
| 3.9 Number of ECTS credits | 8 | | | | |

4. Prerequisites (if necessary)

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|-------------------|---|
| 4.1. curriculum | <ul style="list-style-type: none"> Ability to work with an integrated development environment |
| 4.2. competencies | <ul style="list-style-type: none"> Average programming skills in a visual programming language |

5. Conditions (if necessary)

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| 5.1. for the course | <ul style="list-style-type: none"> An LCD projector |
| 5.2. for the seminar /lab activities | <ul style="list-style-type: none"> Laboratory with twelve computers; high level programming language environment |

6. Specific competencies acquired

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| Professional competencies | <ul style="list-style-type: none"> • Ability to apply knowledge of computing and mathematics appropriate to the discipline; • Ability to analyze a problem, and identify and define the computing requirements appropriate to its solution; • Ability to identify and to specify computing requirements of an application and to design, implement, evaluate, and justify computational solutions; • Ability to use current techniques and skills to integrate available theory and tools necessary for applied computing practices. |
| Transversal competencies | <ul style="list-style-type: none"> • Ability to apply mathematical foundations, algorithmic principles, and computer science theory; • Ability to apply design and development principles in the construction of software systems; • Ability to acquire knowledge properly in an application domain in the modeling and design; • Ability to work effectively in a team. |

7. Objectives of the discipline (outcome of the acquired competencies)

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| 7.1 General objective of the discipline | <ul style="list-style-type: none"> • Good understanding of hands-on applications; • Be able to identify meaningful applied computing problems ; • Be able to apply theories, principles and concepts with technologies to design, develop, and verify computational solutions; |
| 7.2 Specific objective of the discipline | <ul style="list-style-type: none"> • Knowledge about general theory and specific DSS theory; • Systematic knowledge about what the designer of a DSS needs to know; |

8. Content

| 8.1 Course | Teaching methods | Remarks |
|--|--|---------|
| 1. The concept of <i>Decision Support Systems</i> (DSS) - The Steps of Decision Support, Classification of Problems - The Components of a DSS. - Some Computerized Tools for Decision Support | Expositions: description, explanation, introductory lectures, Other methods: case study; company examples. | |
| 2. Computerized Decision Support - Decision Making - Rational Decisions, Definitions of Rationality, Bounded Rationality and Muddling Through - Models, The Facilities of Models , Phases of the Decision-Making Process | Expositions: description, explanation, class lectures, Use of problems: use of problem questions, problems and problem situations. Other methods: company examples. | |
| 3. The Nature of Managers, Appropriate Data Support, Information Processing Models. Group Decision Making | Expositions: description, explanation, dialog-based lectures, current lectures, Use of problems: problems and problem situations. | |
| 4. Decisions and Decision Modeling - Types of Decisions. - Human Judgment and Decision Making. - Modeling Decisions. Components of Decision Models | Expositions: description, explanation, class lectures, dialog-based lectures, current lectures. Other methods: case study; company examples, discussion of material. | |
| 5. Normative Systems - Normative and Descriptive Approaches. | Expositions: description, explanation, class lectures, dialog-based lectures, | |

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| - Decision-Analytic Decision Support Systems. - Equation-Based and Mixed Systems | lectures. Other methods: discussion of material. | |
| 6. Data Component - Characteristics of Information. - Databases to Support Decision Making. - Database Management Systems | Expositions: description, explanation, class lectures, dialog-based lectures, current lectures. Use of problems: use of problem questions, problems and problem situations. | |
| 7. Data Warehouses. - Data Mining and Intelligent Agents | Expositions: description, explanation, class lectures. Use of problems: use of problem questions. | |
| 8. Model Component - Models, Representation, Methodology | Expositions: description, explanation, class lectures, current lectures. Other methods: case study; company examples, discussion of | |
| 9. Model Based Management Systems, Access to Models, and Understandability of Results. - Integrating Models, Sensitivity of a Decision | Expositions: description, explanation, class lectures. Other methods: discussion of material (using and managing information and decision support systems) | |
| 10. Intelligence and Decision Support Systems - Programming Reasoning - Backward Chaining Reasoning and Forward Chaining Reasoning. Knowledge Representation for Decision Support Systems - Computational Intelligence for Decision Support, - Expert Systems and Artificial Intelligence in Decision Support Systems | Expositions: description, explanation, class lectures, dialog-based lectures. Conversations: debate, dialog, conversations for knowledge consolidation, conversations to systematize and synthesize knowledge. Discovery: inductive discovery, deductive discovery. Other methods: case study; cooperation, company examples. | |
| 11. User Interfaces to Decision Support Systems. - Support for Model Construction and Model Analysis. - Support for Reasoning about the Problem Structure in Addition to Numerical Calculations. - Support for Both Choice and Optimization of Decision Variables | Expositions: description, explanation, class lectures, dialog-based lectures, current lectures. Other methods: case study; cooperation, company examples, discussion of material. | |
| 12. Graphical Interface - The Action Language, Menus. Mail Component - Integration of Mail Management. - Implications for DSS Design | Expositions: description, explanation, class lectures, current lectures, synthesis lectures. Conversations: conversations for knowledge consolidation, conversations to systematize and synthesize. | |
| 13. Modeling and Analysis. - Simulation Applications. | Expositions: description, explanation, class lectures, current lectures. Other methods: case study; company examples, discussion of | |
| 14. Business Analytics. - DSS based on Data Warehouse. | Expositions: description, explanation, class lectures. Other methods: discussion of material (using and managing information and decision support systems) | |
| Bibliography | | |

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2. Delic, K.A., Douillet,L. and Dayal, U. "Towards an architecture for real-time decision support systems:challenges and solutions, 2001.
3. Druzdzel, M. J. and R. R. Flynn. Decision Support Systems. Encyclopedia of Library and Information Science. A. Kent, Marcel Dekker, Inc., 1999
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5. French, S. and Geldermann, J. The varied contexts of environmental decision problems and their implications for decision support. Environmental Science and Policy 8 (2005), 378-391.
6. French, S., Carter, E., and Niculae, C. Decision support in nuclear and radiological emergency situations: Are we too focused on models and technology? International Journal of Risk Assessment and Management (2007).
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8. Gadomski, A.M. at al.An Approach to the Intelligent Decision Advisor (IDA) for Emergency Managers.Int. J. Risk Assessment and Management, Vol. 2, Nos. 3/4., 2001.
9. Larissa T. Moss, Shaku Atre, Business Intelligence Roadmap: The Complete Project Lifecycle for Decision-Support Applications By Publisher: Addison Wesley Professional Pub Date: February 25, 2003 Print ISBN-10: 0-201-78420-3 Print ISBN-13: 978-0-201-78420-6 Pages: 576 Slots: 2.0
10. Little, J.D.C. "Models and Managers:The Concept of a Decision Calculus." Management Science, Vol.16, NO.8, April, 1970.

| 8.2 Seminar | | Teaching methods | Remarks |
|-------------|--|---|---------|
| 1. | The first two seminars are dedicated to surveying information sources available on Internet and Intranet, and planning of the papers and projects. | Expositions: description, explanation, introductory lectures. Conversations: debate, dialog, introductory conversations. Other methods: individual study, exercise, homework study. | |
| 2. | | | |
| 3. | The next seven seminars (from three to nine) are dedicated to paper presentations. | Conversations: debate, dialog, introductory conversations, conversations for knowledge consolidation, conversations to systematize and synthesize knowledge. Use of problems: use of problem questions, problems and problem situations. Discovery: directed and independent rediscovery, creative discovery, deductive discovery, discovery by documenting. Other methods: case study; cooperation, individual study, exercise, homework study, company examples, discussion of material. | |
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| 10. | The project design: | Conversations: debate, dialog. Discovery: experimental discovery, | |

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| 11. | - Design a project with specific goals, specific tasks, and specific outcomes; - Set specific beginning and ending dates for your project, set precise deadlines; | discovery by documenting. Other methods: discussion of material. | |
| 12. | | | |
| 13. | The project demos will be scheduled in the last two seminars. | Conversations: debate, dialog. Use of problems: use of problem questions. Discovery: experimental discovery, discovery by documenting. Other methods: discussion of material. | |
| 14. | | | |

Bibliography

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9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

- This course exists in the curriculum of many universities in the world;
- The results of course are considered by companies of software particularly useful and topical.

10. Evaluation

| Type of activity | 10.1 Evaluation criteria | 10.2 Evaluation methods | 10.3 Share in the grade (%) |
|---|---|-------------------------|-----------------------------|
| 10.4 Course | - know the basic elements and concepts of an Dss; | Written exam | 50% |
| 10.5 Seminar / Project | - complexity, importance and degree of timeliness of the synthesis made | Paper presentation | 15% |
| | - apply the course concepts - problem solving | Project presentation | 35% |
| 10.6 Minimum performance standards | | | |
| ➤ At least grade 5 at written exam, paper presentations and project realised. | | | |

Date

April 30, 2017

Signature of course coordinator

Lect. Dr. PREJMEREAN Vasile

Signature of seminar coordinator

Lect. Dr. PREJMEREAN Vasile

Date of approval

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Signature of the head of department

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