**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 | **Software Engineering** |

**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 | **Optional** 1 |

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

| | | | | | |
|---|---|---|---|---|---|
| 3.1 Hours per week | **4** | Of which: 3.2 course | **2** | 3.3 seminar/laboratory | **1sem +1pr.** |
| 3.4 Total hours in the curriculum | **56** | Of which: 3.5 course | **28** | 3.6 seminar/laboratory | **28** |
| Time allotment: | | | | | hours |
| Learning using manual, course support, bibliography, course notes | | | | | **28** |
| Additional documentation (in libraries, on electronic platforms, field documentation) | | | | | **28** |
| Preparation for seminars/labs, homework, papers, portfolios and essays | | | | | **28** |
| Tutorship | | | | | **14** |
| Evaluations | | | | | **21** |
| Other activities: | | | | | |

| | |
|---|---|
| 3.7 Total individual study hours | **119** |
| 3.8 Total hours per semester | **175** |
| 3.9 Number of ECTS credits | **7** |

**4. Prerequisites** (if necessary)

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| 4.1. curriculum | • Ability to work with an integrated development environment |
| 4.2. competencies | • Average programming skills in a visual programming language |

**5. Conditions** (if necessary)

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| 5.1. for the course | • An LCD projector |
| 5.2. for the seminar /lab activities | • Laboratory with twelve computers; high level programming language environment |

**6. Specific competencies acquired**

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| **Professional competencies** | • Ability to apply knowledge of computing and mathematics appropriate to the discipline;<br>• Ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;<br>• Ability to identify and to specify computing requirements of an application and to design, implement, evaluate, and justify computational solutions;<br>• Ability to use current techniques and skills to integrate available theory and tools necessary for applied computing practices. |
| **Transversal competencies** | • Ability to apply mathematical foundations, algorithmic principles, and computer science theory;<br>• Ability to apply design and development principles in the construction of software systems;<br>• Ability to acquire knowledge properly in an application domain in the modeling and design;<br>• 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 | • Good understanding of hands-on applications;<br>• Be able to identify meaningful applied computing problems ;<br>• Be able to apply theories, principles and concepts with technologies to design, develop, and verify computational solutions; |
| 7.2 Specific objective of the discipline | • Knowledge about general theory and specific DSS theory;<br>• Systematic knowledge about what the designer of a DSS needs to know; |

**8. Content**

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

| | | |
|---|---|---|
| - Decision-Analytic Decision Support Systems.<br>- Equation-Based and Mixed Systems | lectures.<br>**Other methods**: discussion of material. | |
| 6. Data Component<br>- Characteristics of Information.<br>- Databases to Support Decision Making.<br>- Database Management Systems | **Expositions**: description, explanation, class lectures, dialog-based lectures, current lectures.<br>**Use of problems**: use of problem questions, problems and problem situations. | |
| 7. Data Warehouses.<br>- Data Mining and Intelligent Agents | **Expositions**: description, explanation, class lectures.<br>**Use of problems**: use of problem questions. | |
| 8. Model Component<br>- Models, Representation, Methodology | **Expositions**: description, explanation, class lectures, current lectures.<br>**Other methods**: case study; company examples, discussion of | |
| 9. Model Based Management Systems, Access to Models, and Understandability of Results.<br>- Integrating Models, Sensitivity of a Decision | **Expositions**: description, explanation, class lectures.<br>**Other methods**: discussion of material (using and managing information and decision support systems) | |
| 10. Intelligence and Decision Support Systems<br>- Programming Reasoning<br>- Backward Chaining Reasoning and Forward Chaining Reasoning.<br>Knowledge Representation for Decision Support Systems<br>- Computational Intelligence for Decision Support,<br>- Expert Systems and Artificial Intelligence in Decision Support Systems | **Expositions**: description, explanation, class lectures, dialog-based lectures.<br>**Conversations**: debate, dialog, conversations for knowledge consolidation, conversations to systematize and synthesize knowledge.<br>**Discovery**: inductive discovery, deductive discovery.<br>**Other methods**: case study; cooperation, company examples. | |
| 11. User Interfaces to Decision Support Systems.<br>- Support for Model Construction and Model Analysis.<br>- Support for Reasoning about the Problem Structure in Addition to Numerical Calculations.<br>- Support for Both Choice and Optimization of Decision Variables | **Expositions**: description, explanation, class lectures, dialog-based lectures, current lectures.<br>**Other methods**: case study; cooperation, company examples, discussion of material. | |
| 12. Graphical Interface<br>- The Action Language, Menus.<br>Mail Component<br>- Integration of Mail Management.<br>- Implications for DSS Design | **Expositions**: description, explanation, class lectures, current lectures, synthesis lectures.<br>**Conversations**: conversations for knowledge consolidation, conversations to systematize and synthesize. | |
| 13. Modeling and Analysis.<br>- Simulation Applications. | **Expositions**: description, explanation, class lectures, current lectures.<br>**Other methods**: case study; company examples, discussion of | |
| 14. Business Analytics.<br>- DSS based on Data Warehouse. | **Expositions**: description, explanation, class lectures.<br>**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
4. Finlay, P. N., Introducing decision support systems. Oxford, UK Cambridge, Mass., NCC Blackwell; Blackwell Publishers, 1994.
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.
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7. Gachet, A. Building Model-Driven Decision Support Systems with Dicodess. Zurich, VDF, 2004.
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, introductive lectures. **Conversations**: debate, dialog, introductive 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, introductive 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. | |
| 4. | | | |
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| 8. | | | |
| 9. | | | |
| 10. | The project design: | **Conversations**: debate, dialog. **Discovery**: experimental discovery, | |

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

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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<br>- problem solving | Project presentation | 35% |
| 10.6 Minimum performance standards | | | |
| ➢ At least grade 5 at written exam, paper presentations and project realised. | | | |

| Date | Signature of course coordinator | Signature of seminar coordinator |
|---|---|---|
| April 22, 2018 | **Lect. Dr. PREJMEREAN Vasile** | **Lect. Dr. PREJMEREAN Vasile** |

Date of approval

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Signature of the head of department

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