syllabus

1. Information regarding the programme

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

2.1 Name of the discipline				**Decision Support Systems**			
2.2 Course coordinator				**Lect. PhD. Radu D. Găceanu**			
2.3 Seminar coordinator				**Lect. PhD. Radu D. Găceanu**			
2.4. Year of study	**2**	2.5 Semester	**3**	2.6. Type of evaluation	**E**	2.7 Type of discipline	**Optional**

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	**1 sem + 1 pr**
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)

4.1. curriculum	• Systems for Design and Implementation • Artificial Intelligence
4.2. competencies	• Average programming skills in a high level programming language

5. Conditions (if necessary)

5.1. for the course	• Room with projector
5.2. for the seminar /lab activities	• Room with projector, with internet access and ability to use personal laptops

6. Specific competencies acquired

Professional competencies	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	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)

7.1 General objective of the discipline	• 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	• 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 Decision Support Systems (DSS) - The Steps of Decision Support, Classification of Problems - The Components of a DSS. - Some Computerized Tools for Decision Support	Presentation, conversation, case studies	
2.Computerized Decision Support	Presentation, conversation, case studies	

- Decision Making - Rational Decisions, Definitions of Rationality, Bounded Rationality and Muddling Through - Models, The Facilities of Models, Phases of the Decision-Making Process		
3.The Nature of Managers, Appropriate Data Support,Information Processing Models. Group Decision Making	Presentation, conversation, case studies	
4.Decisions and Decision Modeling - Types of Decisions. - Human Judgment and Decision Making. - Modeling Decisions. Components of Decision Models	Presentation, conversation, case studies	
5.Normative Systems - Normative and Descriptive Approaches. - Decision-Analytic Decision Support Systems. - Equation-Based and Mixed Systems	Presentation, conversation, case studies	
6.Data Component - Characteristics of Information. - Databases to Support Decision Making. - Database Management Systems	Presentation, conversation, case studies	
7.Data Warehouses. - Data Mining and Intelligent Agents	Presentation, conversation, case studies	
8.Model Component - Models, Representation, Methodology	Presentation, conversation, case studies	
9.Model Based Management Systems, Access to Models, and Understandability of Results. - Integrating Models, Sensitivity of a Decision	Presentation, conversation, case studies	
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	Presentation, conversation, case studies	

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		
12.Graphical Interface - The Action Language, Menus. Mail Component - Integration of Mail Management. - Implications for DSS Design	Presentation, conversation, case studies	
13.Modeling and Analysis. - Simulation Applications.	Presentation, conversation, case studies	
14.Business Analytics. - DSS based on Data Warehouse.	Presentation, conversation, case studies	

Bibliography

1. Alter, S. L. Decision support systems: current practice and continuing challenges. Reading, Mass., Addison-Wesley Pub., 1980.
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.
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).
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 / laboratory	Teaching methods	Remarks

1-2. Administration. Survey of the sources of information available on Internet and Intranet. Choosing the paper topics and scheduling the presentations.	Interactive exposure, Explanation, Conversation.	
3-5. Delivery of paper review.	Interactive exposure, Explanation, Conversation.	
6-8. Delivery of software system review.	Interactive exposure, Explanation, Conversation.	
7-11. Delivery of personal software project.	Interactive exposure, Explanation, Conversation.	
12-14. Delivery of research report.	Interactive exposure, Explanation, Conversation.	

Bibliography

1. Alter, S. L. Decision support systems: current practice and continuing challenges. Reading, Mass., Addison-Wesley Pub., 1980.
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.
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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
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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

- The content of the discipline is consistent with the similar disciplines from other Romanian universities and universities from abroad, as well as with the requirements that potential employers would have in this field.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	The correctness and completeness of the accumulated knowledge.	*Written exam*	10%
10.5 Seminar/lab activities	A review of a recent paper (from the area of DSS)	Evaluation of the *paper review* (a written paper and an oral presentation)	20%
	A review of a software system (any library, framework, tool etc from the area of DSS is a good candidate)	Evaluation of the *software system review* (a written paper and an oral presentation)	20%
	A personal software project on a *selected topic*	Evaluation of the *project* (software implementation, documentation and demonstration)	25%
	A research report on a *selected topic* (the same *selected topic* as the one from the personal software project)	Evaluation of the *project* (software implementation, documentation and demonstration)	25%
10.6 Minimum performance standards			
Each student has to prove that (s)he acquired an acceptable level of knowledge and understanding of the domain, that (s)he is capable of stating these knowledge in a coherent form, that (s)he has the ability to establish certain connections and to use the knowledge in solving different problems. Penalty points are awarded for delays in submissions. Successful passing of the exam is conditioned by the final grade that has to be at least 5.			

Date	Signature of course coordinator	Signature of seminar coordinator
28.04.2021	Lect. PhD. Radu D. Găceanu	Lect. PhD. Radu D. Găceanu

Date of approval

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Signature of the head of department

Prof. PhD. Laura Dioșan