



**MINISTERUL EDUCAȚIEI**  
**UNIVERSITATEA „AUREL VLAICU” DIN ARAD**  
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**SUBJECT SHEET**

**1. Program Data**

1.1. Higher education institution	"AUREL VLAICU" UNIVERSITY OF ARAD
1.2. Faculty	of Exact Sciences
1.3. Department	Department of Mathematics and Computer Science
1.4. Field of study	Mathematics
1.5. Academic year	2024-2025
1.6. Cycle of studies	License
1.7. Specialization / Study Program	Computer Science Mathematics
1.8. Form of education	Full-time education (IF)

**2. Discipline Data**

2.1. Name of the discipline	GICS1005 Software matematic 1
2.2. Education Plan Holder	dr. Deac Dan-Stelian
2.3. Assistant	dr. Deac Dan-Stelian
2.4. Year of study	1
2.5. Semester	1
2.6. Type of assessment	ES
2.7. Discipline regime	Ob

**3. Total estimated time (hours per semester of teaching activities)**

3.1. Number of hours per week	3
3.2. Hours of classes per week	2
3.3. Seminar/laboratory/project hours per week	1
3.4. Total hours of the curriculum	42
3.5. Course hours per semester	28
3.6. Seminar/laboratory/project hours per semester	14
Time Pool Distribution [Hours]	
3.4.1. Study by textbook, course material, bibliography and notes	28
3.4.2. Additional documentation in the library, on specialized electronic platforms and in the field	22
3.4.3. Preparation of seminars/laboratories, assignments, papers, portfolios and essays	28
3.4.4. Tutoring	5
3.4.5. Examinations	4
3.4.6. Other activities ...	0
3.7. Total hours of individual study	83
3.8. Total hours per semester	125
3.9. Number of credits	5

**4. Preconditions (where applicable)**

4.1. Curriculum prerequisites	Mathematical analysis on $\mathbb{R}$ and $\mathbb{R}^n$
4.2. Competence preconditions	Computer operation, text writing with Microsoft Word.

#### 5. Necessary conditions (where applicable)

5.1. Conditions for the course	Video projector, whiteboard, computers with Mathcad Prime 8 installed
5.2. Conditions for the seminar	
5.3. Conditions for conducting the laboratory	Video projector, whiteboard, computers with Mathcad Prime 8 installed
5.4. Conditions for carrying out the project	

#### 6. Specific competences acquired (where applicable)

6.1. Professional competences	C2. Performs C3 analytical mathematical calculations. Synthesize C4 information. Think abstractly C5. Communicates C6 mathematical information. Apply C8 scientific methods. It uses specialized C10 design software. She carries out research activities at interdisciplinary level C15. Use mathematical and computer tools
6.2. Cross-cutting competency	CT1. Show initiative CT4. Work in CT6 teams. Build CT7 team spirit. Planning

#### 7. Objectives of the discipline (where applicable)

7.1. General objective of the discipline	Formation of symbolic calculation skills, mathematical modeling, mathematical problem solving with the help of symbolic calculation
7.2. Specific objectives	These skills are necessary to be able to do scientific research. The knowledge can be used in the master's and doctoral study cycles.

#### 8. Contents (where applicable)

8.1 Course Content	Teaching methods	Observations
1. Mathcad window and menus, 2 hours; 2. Mathcad pallets, 2 hours; 3. Symbolic palette and Symbolic menu, 2 hours; 4. Evaluation function (Symbolically, Floating Point and Complex), 2 hours; 5. Simplify and Expand functions, 2 hours; 6. Factor, Collect and Coeffs functions, 2 hours; 7. Functions related to variables (Solve, Substitute, Differentiated), 2 hours; 8. Functions related to variables (Integrate, Expand Series, Convert to Partial Fraction), 2 hours; 9. Symbolic functions for matrices (Transpose, Invert and Determinant), 2 hours; 10. 2D graphical representation for given functions in parametric, implicit and explicit form; 2 hours 11 a.m. Symbolic calculus of derivatives, integrals, limits and series, 4 hours; 12. Symbolic Solving of Differential Equations, 4 hours	- interactive exposition - heuristic conversation - exemplification - problemization - modeling	28 hours
8.2 Course Bibliography  [1] Brent Maxfield, Essential Mathcad for Engineering, Science, and Math, Second Edition, Academic Press, 2009 [2] Cira, O., Marușter S, t., Numerical Methods for Nonlinear Equations, MatrixRom Publishing House, Bucharest, 2008 [3] Cira, O., Applications, Problems and Exercises Solved with Mathcad, MatrixRom Publishing House, Bucharest, 2010 [4] Cira, O., The Convergence Simultaneous Inclusion Methods, MatrixRom Publishing House, Bucharest, 2012 [5] Deac D. Mathematical Software 1 Course and Laboratory Notes on the SUMS Platform [6] ***, Mathcad Prime 2.0 Curriculum Guide, Parametric Technology Corporation, 140 Kendrick Street,Needham, MA 02494 USA, August 2012		
8.3 Seminar Content	Teaching methods	Observations
8.4 Seminar Bibliographies		
8.5 Lab Content	Teaching methods	Observations
1. Mathcad window and menus, 1 hours; 2. Mathcad pallets, 1 hour; 3. Symbolic palette and Symbolic menu, 1 hour; 4. Evaluation function (Symbolically, Floating Point and Complex), 1 hours; 5. Simplify and Expand functions, 1 hours; 6. Factor, Collect and Coeffs functions, 1 hours; 7. Functions related to variables (Solve, Substitute, Differentiated), 1 hours; 8. Functions related to variables (Integrate, Expand Series, Convert to Partial Fraction), 1 hour; 9. Symbolic functions for matrices (Transpose, Invert and Determinant), 1 hour; 10. 2D graphical representation for given functions in parametric, implicit and explicit form; 2 hours 11 a.m. Symbolic calculus of derivatives, integrals, limits and series, 1 hour; 12. Symbolic Solving of Differential Equations, 2 hours	Exercise app	14 hours
8.6 Laboratory bibliography  [1] Brent Maxfield, Essential Mathcad for Engineering, Science and Math, Second Edition, Academic Press, 2009 [2] Cira, O., Marușter S, t., Metode numerice pentru ecuații neliniare, Ed. MatrixRom, București, 2008 [3] Cira, O., Aplicații, probleme și exerciții rezolvate cu Mathcad-ul, Ed. MatrixRom, București, 2010 [4] Cira, O., The Convergence Simultaneous Inclusion Methods, Ed. MatrixRom, București, 2012 [5] Deac D. Software mathematic 1 Note de curs și laborator platforma SUMS [6] ***, Getting Started Guide, Mathcad 15.0, Parametric Technology Corporation, 140 Kendrick Street, Needham, MA 02494 USA, June 2010 [7] ***, Mathcad Prime 2.0 Curriculum Guide, Parametric Technology Corporation, 140 Kendrick Street, Needham, MA 02494 USA, August 2012		
8.7 Project Content	Teaching methods	Observations
8.8 Project Bibliography		

#### 9. Corroborating/validating the contents of the discipline (where applicable)

The content of the discipline is in accordance with the content of similar disciplines in other university centers in the country and abroad. In order to better adapt the content of the discipline to the requirements of the labor market, meetings were held both with employers - representatives of the business environment and with mathematics and computer science teachers from the pre-university education in Arad.

**10. Assessment (where applicable)**

Activity Type	Evaluation criteria	Evaluation methods	Weight of the final grade
10.1. Course	<b>Correctness and completeness of knowledge Logical coherence Degree of assimilation of specialized language Conscientiousness, interest for study</b>	Free presentation of the student Evaluation conversation Oral quizzes. Active participation in courses.	50% 10%
10.2. Seminar			
10.3. Laboratory	<b>ability to operate with assimilated knowledge; conscientiousness, interest in study</b>	Evaluation of a project along the way Active participation in laboratory applications	30% 10%
10.4. Project			
10.5 Minimum Performance Standard			
<b>Acquiring fundamental concepts, using specialized language, making a simple application</b>			

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Dan-Stelian

Assistant dr. Deac  
Dan-Stelian

DEPARTMENT DIRECTOR  
Reader Popa Lorena

DEAN  
Prof.univ.dr. Sorin-Florin NĂDĂBAN