



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	GICS6A13 Software matematic 2
2.2. Education Plan Holder	dr. Deac Dan-Stelian
2.3. Assistant	dr. Deac Dan-Stelian
2.4. Year of study	3
2.5. Semester	2
2.6. Type of assessment	ES
2.7. Discipline regime	Op

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

3.1. Number of hours per week	4
3.2. Hours of classes per week	2
3.3. Seminar/laboratory/project hours per week	2
3.4. Total hours of the curriculum	56
3.5. Course hours per semester	28
3.6. Seminar/laboratory/project hours per semester	28
Time Pool Distribution [Hours]	
3.4.1. Study by textbook, course material, bibliography and notes	27
3.4.2. Additional documentation in the library, on specialized electronic platforms and in the field	14
3.4.3. Preparation of seminars/laboratories, assignments, papers, portfolios and essays	28
3.4.4. Tutoring	0
3.4.5. Examinations	4
3.4.6. Other activities ...	0
3.7. Total hours of individual study	69
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} , Linear Algebra, Analytic Geometry, Differential Equations, Partial Differential Equations
4.2. Competence preconditions	Computer operation, text editing with Microsoft Word, Mathcad Prime 8 operation

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	C1. Operating with mathematical notions and methods. C2. Mathematical data processing, analysis and interpretation of phenomena and processes. C3. Development and analysis of algorithms for problem solving
6.2. Cross-cutting competency	CT1. Applying the rules of rigorous and efficient work, manifesting responsible attitudes towards the scientific and didactic field, for the optimal and creative capitalization of one's own potential in specific situations, in compliance with the principles and norms of professional ethics. CT3. Efficient use of information sources and communication resources and assisted professional training, both in Romanian and in an international language.

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 Mathcad Prime 8 software
7.2. Specific objectives	Learning techniques for modeling and solving mathematical problems, using mathematical software. 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. Algorithms in Mathcad. a) Sequential algorithms and branched algorithms. (2 hours) b) Cyclic algorithms. (2 hours) c) Search algorithms in ordered strings. (2 hours) 2. Numerical methods for determining approximate solutions of nonlinear equations. (4 hours) 3. Numerical methods for approximating the roots of algebraic equations, of degree n with coefficients of real or complex numbers. (4 hours) 4. Numerical methods for approximating solutions to systems of nonlinear equations. (4 hours) 5. Matrix generation. (2 hours) 6. Symbolic solution of classical differential equations of order 1 (4 hours) 7. Symbolic solution of differential equations of order 2 with constant coefficients (4 hours)	interactive exposition problematizing the heuristic conversation	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] P.C. Pop, Operational Research , Risoprint Publishing House, Cluj-Napoca, 2007. [4] Cira, O., The Convergence Simultaneous Inclusion Methods , Ed. MatrixRom, București, 2012 [5] Deac D. Software mathematic 2 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		
8.3 Seminar Content	Teaching methods	Observations
8.4 Seminar Bibliographies		
8.5 Lab Content	Teaching methods	Observations
1. Algorithms in Mathcad. a) Sequential algorithms and branched algorithms. (2 hours) b) Cyclic algorithms. (2 hours) c) Search algorithms in ordered strings. (2 hours) 2. Numerical methods for determining approximate solutions of nonlinear equations. (4 hours) 3. Numerical methods for approximating the roots of algebraic equations, of degree n with coefficients of real or complex numbers. (4 hours) 4. Numerical methods for approximating solutions to systems of nonlinear equations. (4 hours) 5. Matrix generation. (2 hours) 6. Symbolic solution of classical differential equations of order 1 (4 hours) 7. Symbolic solution of differential equations of order 2 with constant coefficients (4 hours)	interactive exhibition problematization modeling	28 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., Numerical Methods for Nonlinear Equations , MatrixRom Publishing House, Bucharest, 2008 [3] P.C. Pop, Operational Research , Risoprint Publishing House, Cluj-Napoca, 2007. [4] Cira, O., The Convergence Simultaneous Inclusion Methods , Ed. MatrixRom, București, 2012 [5] Deac D. Software mathematic 2 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 to the requirements of the labor market and the content of the discipline, 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	correctness and completeness of knowledge, logical coherence, degree of assimilation of the specialized language. conscientiousness, interest in study	Free presentation of the student Evaluation conversation Oral quizzes. Active participation in courses.	50% 10%
10.2. Seminar			
10.3. Laboratory	ability to operate with assimilated knowledge, conscientiousness, interest in study	Evaluation of a project along the way Active participation in laboratory applications	30% 10%
10.4. Project			
10.5 Minimum Performance Standard			
Learning fundamental concepts, using specialized language, making a simple application in Mathcad Prime 8			

Titular dr. Deac
Dan-Stelian Asistent

dr. Deac Dan-Stelian

DEPARTMENT DIRECTOR
Reader Popa Lorena

DEAN
Prof.univ.dr. Sorin-Florin NĂDĂBAN