ANEXA 1

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CURRICULUM
Valid for the study cycle 2022-2024
"Aurel Vlaicu" University of Arad

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Faculty of Exact Sciences
Department **Mathematics and Computer Science**
Name of program **Applied computer science in technology, economics and science**
Field of studies **Informatics**
Type of program **Professional**
Length of program / number of ECTS credits   **2 years /120 credits**
Type of education **With attendance**
Graduate title earned   **Master in informatics**

1. MISSION STATEMENT

An integral part of the Faculty of Exact Sciences, the master's program, Applied Computer Science in Science, Technology and Economics has as main mission the training of specialists in computer science, programming, databases, in the spirit of democracy, equal opportunities and human personality development.

2. OBJECTIVES

- Development of skills to analyze economic and social facts and phenomena and to propose solutions;
- Capitalizing on the knowledge acquired by graduates in professional and scientific projects in order to meet the challenges of the Romanian and European economy;
- Training skills to develop and use methods, procedures and tools of scientific research, as well as developing in graduates the ability to formulate scientific explanations for economic and social phenomena and processes
- Stimulating the interest of graduates for continuous professional, scientific and specialized training in order to effectively adapt to the requirements of the knowledge-based society;
- Training of professional communication skills in English, of effective integration in both work teams and multinational / international research teams.

3. SPECIFIC EDUCATIONAL OBJECTIVES (COMPETENCES TO BE ACQUIRED)

Professional competencies:

C1 Developing mathematical models for processes and systems that can be applied in engineering and economics.
C2 Model various processes, design and deploy computational and symbolic models.
C3 Use computer related tools for developing software dedicated to solve problems in various fields of sciences, technology and economics.
C4 Read specifications and perform data analysis, design, development as well as deployment of databases using software systems.
C5 Perform data analysis and generate results for supporting decision making processes.
C6 Elaborate comparative studies of computer systems with respect to their functionalities, efficiency and information security, and perform consultancy in the field of informatics.
C7 Ability to provide consultancy in the application of informatics in science, technology and economics.

Transversal educational competencies:

CT1 General knowledge of computer systems and their integration in various organizations, and continuously learning new concepts and new technologies in the field of computer science.
CT2 Communicate in English on professional subjects with computer specialists, engineers and economists; elaborate technical reports and scientific memos.

CT3 Ability to educate and instruct in the field of high school and higher education in the domain of computer science and related subjects.
CT4 Perform efficiently within a multidisciplinary team while observing, respecting, and abiding by the professional ethics rules of the specific field.

4. ACADEMIC CAREER DEVELOPMENT

The graduates of the Master of Science (MSc) program in "**Applied computer science in technology, economics and science**", according to the Romanian Occupational Catalogue (COR – ISCO-08), can be hired in the following positions:

2511 – code 251101 Computer System Designer

5. FINAL STIPULATIONS

The Curriculum will be approved, according to the National Education Law, art.137 (2), by the university Senate and after being signed on each page the President of the Senate. Aproved Curriculum valid for study cycle 2022-2024.

6. ANALYZIS OF THE CURRICULUM

For the curriculum of the Master of Science (MSc) program "Applied computer science in technology, economics and science", the classification of the courses is presented in the following tables:

- The total number of courses divided in categories according the subject type (proficiency, synthesis, advanced):

Nr. crt.	Subject Type	Hours per week		
		Hours	Ratio %	
			Study program	ARACIS regulations
1	proficiency course (DA)	336	42,9%	min. ---,0
2	synthesis course (DT)	280	35,7%	min. ---,0
3	advanced course (DU)	168	21,4%	min. ---,0
	TOTAL	**784**	**100,00%**	---

- The total number of hours of this program is 784 (392 hours oflectures and 392 hours of practical activities) divided as follows:

  - Compulsory requirements **784hours**
  - Internship...**112hours**
  - Internship to prepare the Master Thesis **70hours**
  Total..**784hours**

- Curriculum structure, according course types (compulsory and elective):

Course	Hours per curriculum	
	Hours	Ratio %
Compulsory courses	616	78,6%
Elective courses	168	21,8% (ARACIS regulations - min --%)
TOTAL	784	100%

- The ratio between lectures and practice (seminars, laboratories, projects, internship) is 1:1 (392 course hours / 392 practice hours), complying with the ARACIS regulations.

- The Master of Science (MSc) program in "**Applied computer science in technology, economics and science**" complies with the national qualifications provided by the Government Decree HG 1175/2006.

- The courses included in the Curriculum and the subjects studied are perfectly aligned with the Bachelor program (BSc) in Informatics (English) (HG 1175/2006, HG 676/2007).

- The curriculum of the Master of Science (MSc) program in "**Applied computer science in technology, economics and science**" complies with the European Credit Transfer and Accumulation System (ECTS) and with the Romanian Law 400/2006 on the organizing of university master studies.

7. TIME SKEDULLING OF THE ACADEMIC YEAR (WEEKS)

Year	Didactic activities (weeks)		Exams (weeks)			Internship	Holiday (weeks)		
	Sem. I	Sem. II	Winter session	Summer session	Retake session		Winter	Between semesters	Summer
Year I	14	14	3	3	2	-	4	1	10
Year II	14	14	3	2	1	70 hrs*	4	1	-

*Distributed along the 14 weeks of Sem.II

8. HOURS PER WEEK OF COMPULSORY AND ELECTIVE COURSES

Year	Semester I (hours / week)		Semester II (hours / week)	
	Compulsory courses	Elective courses	Compulsory courses	Elective courses
I	14	0	14	0
II	8	6	8	6

9. REQUIREMENTS FOR PASSING, PROMOTION AND COMEBACK

The requirements for passing (admission to the next academic year), promotion or comeback to studies are stated in the ECTS Regulations, in the Procedure of organizing the didactic activity and students grading and in the Regulation of students' professional activity based on credits transfer.

10. THE MASTER THESIS

The requirements for preparing, submitting and defending the Master Thesis are stated in the Methodology regarding the organizing and conducting the final exams.
- Communicating the subjects for the Master Thesis: 1-30 October
- Preparing the Master Thesis: 1st of November – 31st of May
- Submitting and defending the Master Thesis: 15th of June – 15st of July
- The final exam consists of defending the Master Thesis (10 credits)

11. THE ECTS CREDITS ASSOCIATED WITH THE MASTER PROGRAM

Total 120**credits**
- 76,7% credits from compulsory courses
- 23,3% credits from elective courses

RECTOR   **DEAN**   **HEAD OF DEPARTMENT**
Ramona LILE   Marius-Lucian TOMESCU   Lorena-Camelia POPA

„Aurel Vlaicu" University of Arad
Faculty of Exact Sciences
Department: Mathematics and Computer Science
Field: Informatics
Study program: Applied computer science in technology, economics and science

CURRICULUM
Academic year 2022-2023
Year I

Cod disciplina	Discipline	Tip disci-plina	S.I./ Sem (ore)	Număr de ore săptămânal şi forma de evaluare											
				Semestrul I 14 săptămâni						Semestrul II 14 săptămâni					
				C	S	L	Pr	Ev	K	C	S	L	Pr	Ev	K
DISCIPLINE OBLIGATORII IMPUSE															
GmDA1O01	Securitatea informației/ Information security	DA	108	2	-	1	-	Ex	6	-	-	-	-	-	-
GmDA1O02	Modelare matematică și optimizare/ Mathematical modeling and optimization	DA	108	2	1	-	-	Ex	6	-	-	-	-	-	-
GmDU1O03	Fundamentele teoriei cuantice/ Fundamentals of Quantum theory	DU	108	2	-	1	-	Ex	6	-	-	-	-	-	-
GmDT1O04	Metode avansate de analiza datelor/ Advanced data analysis methods	DT	133	2	-	1	-	Ex	7	-	-	-	-	-	-
GmDT1O05	Proiect de cercetare în baze de date/ Research project in database	DT	97	-	-	-	2	C	5	-	-	-	-	-	-
GmDA2O06	Programare pe platforme mobile/ Programming on mobile platforms	DA	108	-	-	-	-	-	-	2	-	1	-	Ex	6
GmDT2O07	Programarea bazelor de date/Database programming	DT	133	-	-	-	-	-	-	2	-	1	-	Ex	7
GmDA2O08	Sisteme dinamice/Dynamic systems	DA	108	-	-	-	-	-	-	2	1	-	-	Ex	6
GmDA2O09	Matematici computaţionale/ Computational mathematics	DA	108	-	-	-	-	-	-	2	1	-	-	Ex	6
GmDT2O10	Proiect în programare pe platforme mobile/ Project in programming on mobile platforms	DT	97	-	-	-	-	-	-	-	-	-	2	C	5
TOTAL DISCIPLINE OBLIGATORII				**8**	**1**	**3**	**2**	**-**	**30**	**8**	**2**	**2**	**2**	**-**	**30**
DISCIPLINE FACULTATIVE															
GmDT1F11	Psihopedagogia adolescenților, tinerilor și adulților/ Psycho-pedagogy of adolescents, young people and adults	DT	83	2	1	-	-	Ex	5	-	-	-	-	-	-
GmDA1F12	Didactica domeniului și dezvoltări în didactica informaticii/ The didactics of the field and developments in the didactics of informatics	DA	83	2	1	-	-	Ex	5	-	-	-	-	-	-
GmDT2F13	Proiectarea și managementul programelor educaționale/ Design and management of educational programs	DT	83	-	-	-	-	-	-	2	1	-	-	Ex	5
GmDA2F14	Consiliere și orientare/ Counseling and guidance	DA	83	-	-	-	-	-	-	1	2	-	-	Ex	5

RECTOR
Ramona LILE

DEAN
Marius-Lucian TOMESCU

HEAD OF DEPARTMENT
Lorena-Camelia POPA

Legend: C – Lecture; S – Seminar; L – Laboratory; P – Project; SI – Individual Study; Ev – Evaluation; K – Credits;
           DA– proficiency course; DT – synthesis course; DU – advanced course

CURRICULUM
Academic year 2023-2024
Year II

Code	Subject	Course status	S.I./ Sem (hrs)	1st Semester 14 weeks						2st Semester 14 weeks					
				C	S	L	Pr	Ev	C	C	S	L	Pr	C	K
COMPULSORY COURSES															
GmDU3O01	Tehnici avansate de modelare si simulare/ Advanced Modeling and Simulation techniques	DU	108	2	-	2	-	Ex	7	-	-	-	-	-	-
GmDT3O02	Proiect în e-business/ Projects in e-business	DT	97	-	-	-	2	C	5	-	-	-	-	-	-
GmDA3O03	Metodologia cercetării ştiinţifice/ Scientific research methodologies	DA	97	1	1	-	-	C	4	-	-	-	-	-	-
GmDT4O04	Proiect de cercetare în inteligenţă artificială/ Research project in artificial intelligence	DT	147	-	-	-	-			-	-	-	2	C	7
GmDT4O05	Etică și integritate academică/ Academic ethics and integrity	DT	36	-	-	-	-			1	-	-	-	C	2
GmDT4O06	Elaborarea lucrării de disertaţie/ Elaboration of the dissertation thesis	DT	105	-	-	-	-			-	-	-	5	C	7
	TOTAL			**3**	**1**	**2**	**2**	**-**	**16**	**1**	**-**	**-**	**7**	**-**	**16**
ELECTIVE COURSES															
	Package 1														
GmDA3A11	Fundamente ale reţelelor neuronale biologice/ Biological Neural Networks Fundamentals	DA	133	2	1	-	-	Ex	7	-	-	-	-	-	-
GmDA3A12	Grupuri Lie în fizica particulelor/ Lie groups in particle physics	DA	133	2	1	-	-	Ex	7	-	-	-	-	-	-
GmDA3A13	Teoria sistemelor stochastice/ The theory of stochastic systems	DA	133	2	1			Ex	7						
	Package 2														
GmDU3A21	E-business/ E-business	DU	133	2	-	1	-	Ex	7	-	-	-	-	-	-
GmDU3A22	Sisteme suport pentru decizii/ Decision support systems	DU	133	2	-	1	-	Ex	7	-	-	-	-	-	-
	Package 3														
GmDA4A31	Sisteme fuzzy/ Fuzzy systems	DA	133	-	-	-	-	-	-	2	-	1	-	Ex	7
GmDA4A32	Statistică aplicată în ştiinţe tehnice și naturale/ Statistics applied in technical and natural sciences	DA	133	-	-	-	-	-	-	2	-	1	-	Ex	7
	Package 4														
GmDU4A41	Programare în Mathcad și MATLAB/ Programming in Mathcad and MATLAB	DU	133	-	-	-	-	-	-	2	-	1	-	Ex	7
GmDU4A42	Probleme computaţionale ale reţelelor neuronale artificiale/ Computational Aspects of Artificial Neural Networks	DU	133	-	-	-	-	-	-	2	-	1	-	Ex	7
GmDU4A43	Sisteme inteligente/ Intelligent systems	DU	133	-	-	-	-	-	-	2	-	1	-	Ex	7
	TOTAL			**4**	**1**	**1**	**-**	**-**	**14**	**4**	**-**	**2**	**-**	**-**	**14**
TOTAL				**7**	**2**	**3**	**2**	**-**	**30**	**5**	**-**	**2**	**7**	**-**	**30**
FACULTATIVE COURSES															
GmDA3F07	Practică pedagogică în învăţământul preuniversitar și universitar/ Pedagogical practice in pre-university and university education	DA	83	-	3	-	-	C	5	-	-	-	-	-	-

GmDA3F08	Educație interculturală/ Intercultural Education	DA	83	1	2	-	-	Ex	5	-	-	-	-	-	-
Examen de absolvire a *Programul de formare psihopedagogică în vederea certificării competențelor pentru profesia didactică* Nivel II/ Final Assessment: Level II								Exam				5 credits			

Activity	Evaluation	Credits
Final exam for the Master's degree	Exam	10

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