ANEXA 1

CURRICULUM

Valid for the study cycle 2023-2026
"Aurel Vlaicu" University of Arad

Faculty of Exact Sciences
Department: **Mathematics and Computer Science**
Name of program: **Computer Science**
Field of studies: **Informatics**
Length of program / number of ECTS credits: **3 years /180 credits**
Type of education: **Full – Time study**
Graduate title earned: **Bachelor in Computer Science**

1. MISSION STATEMENT

The teaching and research mission of the bachelor study programme in question fits the profile and speciality of the Faculty of Exact Sciences. It consists in training high qualified profesionals in the fields of informatics according to „demand and supply" dynamics on the job market and the requirements of Romania's full integration in the EU.

2. OBJECTIVES

- Realizarea Maintaining a high level of scientific training to be transferred to the students in the Mathematics & Computer Science, compatibile with the EU standards and the possibility for them to opt for certain study routes in order to rapidly be integrated into the professional activity;
- Promoting a modern and flexible curriculum, according to european valuesof a socity based on knowledge, favoring the interdisciplinarity and the methodologies of teaching, learning and evaluating, depending on the shape and dynamics of the field;
- Achieving a true quality of the teaching-learning process by making use of some continuously evolving didactical strategies;
- Stimulating the interest to continue the professional training and scientific research in order to efficiently to the requirements of a knowledge-oriented society.

3. SPECIFIC EDUCATIONAL OBJECTIVES (COMPETENCES TO BE ACQUIRED)

Professional competencies:

C1.Programming in high level programming languages;
C2.Development and maintenance of computer applications;
C3.Using computer tools in interdisciplinary context;
C4.Using the theoretical bases of computers and formal models;
C5.Database design and database management;
C6.Designing and management af computer networks;
C7. Using modern technologies for information security.

Transversal competencies:

CT1.Applying the rules of organized and efficient work, of responsible attitudes towards teaching-scientific field, to value the own creative potential, while respecting the principles and norms of professional ethics.
CT2.Efficient conduct of the activities organized in an inter-disciplynary group and developing the personal communication skills, networking and collaboration with various groups;
CT3.Using of efficient methods and techniques for learning, informing, research and development of the capacity to value knowledge, adapting to the requirements of a dynamic society and communicating in English and in an Internationally widespread language.

4. ACADEMIC CAREER DEVELOPMENT

Bachelor's degree graduates "**Computer Science**" according to the Romanian Occupational Catalogue (COR – ISCO-08), can be hired in the following positions:

251202 – programmer

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. The Curriculum is valid until the next revision.
Aproved Curriculum valid for study cycle 2023-2026.

6. ANALYZIS OF THE CURRICULUM

- **In Curriculum** for **Computer Science** study program the taught disciplines are included with the following weights:

Nr. crt.	Subject Type	Hours /Study program _____		
		Hours	Ratio %	
			Study program ____	ARACIS regulations
1	Fundamentals (DF)	826	44,7%	35-45%
2	Specialty (DS)	742	40,2%	35-50%
3	Complementary (DC)	280	15,1%	10-20%
TOTAL		1848	100%	-

- - The total number of hours of this program is 1848, divided as follows:

  - Compulsory requirements ..... **1848 hours**
  - Internship……**120 hours**
  - Internship to prepare the Bachelor Thesis..... **84 hours**

  Total……..**1848 hours**

  ARACIS regulations (1848 ÷ 2352 hours)
- Curriculum structure, according course types (compulsory and elective):

Course	Hours per curriculum	
	Hours	Ratio %
Compulsory courses	1414	76,5% (ARACIS regulations 70%-83%)
Elective courses	434	23,5% (ARACIS regulations 30%-17%)
TOTAL	1848	100%

- The ratio between lectures and practice (seminars, laboratories, projects, internship) is 1:1,1 (882 hours/966hours) complying with the ARACIS regulations 1:1+50%.
- The ratio of the facultative disciplines to the total number of hours 10,2%.
- Study program **Computer Science** and Informatics domain fit the national qualifications in HG 1175/2006.
- The courses included in the Curriculum and the subjects studied are perfectly aligned with the Bachelor program (BSc) in **Computer Science** (HG 1175/2006, HG 676/2007).
- The curriculum of the with the Bachelor program (BSc) program "**Computer Science**" complies with the European Credit Transfer and Accumulation System (ECTS) and with the Romanian Law 288/2004, alin. 9.

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	3	2	4	4	1	6
Year III	14	14	3	2	1	84*	3	1	-

* Distributed along the 14 weeks of Sem.II

Practice is organized according to firm rules stated in documents conceived by the Mathematics & Computer Science and approved by the Faculty Council. Practice activities can take place both at faculty's laboratories and certain economic units (based on "practice cnventions").

HOURS PER WEEK OF COMPULSORY AND ELECTIVE COURSES

Year	Semester I (hours/week)	Semester II (hours/week)	
I	22	22	
II	22	22	4 weeks – Internship (120 hours)
III	22	22	84 hours (14 weeks x 6 hours) - Internship to prepare the Bachelor Thesis

7. 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.

8. THE BACHELOR THESIS

The requirements for preparing, submitting and defending the Bachelor Thesis are stated in the Methodology regarding the organizing and conducting the final exams.

- Communicating the subjects for the Bachelor Thesis: 1-30 October
- Preparing the Bachelor Thesis: 1st of November – 31st of May
- Submitting and defending the Bachelor Thesis: 15th of June – 15st of July
- The final exam consists:

- Testing the general and specialized knowledge – 5 credits
- Defending the bachelor's thesis – 5 credits

9. THE ECTS CREDITS ASSOCIATED WITH THE STUDY PROGRAM

- 85 ETC for fundamental disciplines
- 72 ETC for specialty disciplines
- 27 ETC for complementary disciplines

Total 184 ETC

from compulsory courses (included 4 ETC for Sport)

- 140 ETC from compulsory courses
- 44 ETC from elective courses
- 25 ETC supplementary for diploma

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: Computer Science

CURRICULUM

Academic year 2023-2024
Year I

Code	Subject	Course status	S.I./ Sem (hrs)	Hours per week and Evaluation type											
				1st Semester 14 weeks						2nd Semester 14 weeks					
				C	S	L	Pr	Ev	K	C	S	L	Pr	Ev	K
COMPULSORY COURSES															
GlAF1O01	Mathematical and Computational Logic	DF	83	2	1	-	-	Ex	5	-	-	-	-	-	-
GlAF1O02	Computer System Architecture	DF	83	2	-	1	-	Ex	5	-	-	-	-	-	-
GlAF1O03	Differential and Integral Calculus	DF	69	2	2	-	-	Ex	5	-	-	-	-	-	-
GlAF1O04	Fundamentals of Programming	DF	94	2	-	2	-	Ex	6	-	-	-	-	-	-
GlAS1O05	Web Application Development	DS	94	2	-	2	-	Ex	6	-	-	-	-	-	-
GlAC1O06	Sports 1	DC	-	-	2	-	-	C	2	-	-	-	-	-	-
GlAF2O07	Operating System	DF	83	-	-	-	-	-	-	2	-	1	-	Ex	5
GlAF2O08	Geometry	DF	69	-	-	-	-	-	-	2	2	-	-	Ex	5
GlAF2O09	Algebraic Foundations of Computer Science	DF	69	-	-	-	-	-	-	2	2	-	-	Ex	5
GlAF2O10	Fundamental Algorithms	DF	94	-	-	-	-	-	-	2	-	2	-	Ex	6
GlAF2O11	Data Structures	DF	94	-	-	-	-	-	-	2	-	1	-	Ex	6
GlAC2O12	Sports 2	DC	-	-	-	-	-	-	-	-	2	-	-	C	2
	TOTAL			**10**	**5**	**5**	**-**	**-**	**27 +2**	**10**	**6**	**4**	**-**	**-**	**27 +2**
ELECTIVE COURSES															
	Package 1														
GlAC1A13	English 1	DC	47	-	2	-	-	C	3	-	-	-	-	-	-
GlAC1A14	French 1	DC	47	-	2	-	-	C	3	-	-	-	-	-	-
GlAC1A15	German 1	DC	47	-	2	-	-	C	3	-	-	-	-	-	-
	Package 2														
GlAC2A16	English 2	DC	47	-	-	-	-	-	-	-	2	-	-	C	3
GlAC2A17	French 2	DC	47	-	-	-	-	-	-	-	2	-	-	C	3
GlAC2A18	German 2	DC	47	-	-	-	-	-	-	-	2	-	-	C	3
	TOTAL			**-**	**2**	**-**	**-**	**-**	**3**	**-**	**2**	**-**	**-**	**-**	**3**
TOTAL				**10**	**7**	**5**	**-**	**-**	**30 +2**	**10**	**8**	**4**	**-**	**-**	**30 +2**
FACULTATIVE COURSES															
GlAC1F19	History of mathematics	DC	22	1	1	-	-	C	2	-	-	-	-	-	-
GlAS2F20	Mathematical Software	DS	83	-	-	-	-	-	-	2	-	1	-	Ex	5

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Legend: C – Lecture; S – Seminar; L – Laboratory; P – Project; SI – Individual Study; Ev – Evaluation; K – Credits;
DF - Fundamentals course; DS – Specialty course; DC – Complementary course

„Aurel Vlaicu“ University of Arad
Faculty of Exact Sciences
Department: Mathematics and Computer Science
Field: Informatics
Study program: Computer Science

CURRICULUM

Academic year 2024-2025
Year II

Code	Subject	Course status	S.I./ Sem (hrs)	Hours per week and Evaluation type											
				1st Semester 14 weeks						2nd Semester 14 weeks					
				C	S	L	Pr	Ev	C	C	S	L	Pr	C	K
COMPULSORY COURSES															
GlAF3O01	Computer Networks	DF	69	2	-	2	-	Ex	5	-	-	-	-	-	-
GlAF3O02	Algorithmics of Graphs	DF	94	2	-	2	-	Ex	6	-	-	-	-	-	-
GlAF3O03	Databases	DF	94	2	-	2	-	Ex	6	-	-	-	-	-	-
GlAS3O04	Object Oriented Programming	DS	69	2	-	2	-	Ex	5	-	-	-	-	-	-
GlAC3O05	Differential Equations and with Partial Derivatives	DC	69	2	2	-	-	Ex	5	-	-	-	-	-	-
GlAF4O06	Probabilities and Statistics	DF	69	-	-	-	-	-	-	2	2	-	-	Ex	5
GlAF4O07	Automatic computability and complexity	DF	69	-	-	-	-	-	-	2	-	2	-	Ex	5
GlAS4O08	Mobile Application Development	DS	69	-	-	-	-	-	-	2	-	2	-	Ex	5
GlAS4O09	Database Management Systems	DS	69	-	-	-	-	-	-	2	-	2	-	Ex	5
GlAS4O10	Specialty Practice	DS	120 hrs (4 week. x 6 hrs x 5 day) taking place after the active conclusion. didactic of the sem. 4											C	2
	TOTAL			**10**	**2**	**8**	**-**	**-**	**27**	**8**	**2**	**6**	**-**	**-**	**22**
ELECTIVE COURSES															
	Package 1														
G1AC3A11	English 3	DC	47	-	2	-	-	C	3	-	-	-	-	-	-
G1AC3A12	French 3	DC	47	-	2	-	-	C	3	-	-	-	-	-	-
G1AC3A13	German 3	DC	47	-	2	-	-	C	3	-	-	-	-	-	-
	Package 2														
G1AC4A14	English 4	DC	47	-	-	-	-	-	-	-	2	-	-	C	3
G1AC4A15	French 4	DC	47	-	-	-	-	-	-	-	2	-	-	C	3
G1AC4A16	German 4	DC	47	-	-	-	-	-	-	-	2	-	-	C	3
	Package 3														
GlAF4A17	Formal languages and compilers	DF	69	-	-	-	-	-	-	2	-	2	-	Ex	5
GlAF4A18	Computer Security	DF	69	-	-	-	-	-	-	2	-	2	-	Ex	5
	TOTAL			**-**	**2**	**-**	**-**	**-**	**3**	**2**	**2**	**2**	**-**	**-**	**8**
TOTAL				**10**	**4**	**8**	**-**	**-**	**30**	**10**	**4**	**8**	**-**	**-**	**30**
FACULTATIVE COURSES															
GlAC3F19	History of Computing Systems	DC	22	1	1	-	-	C	2	-	-	-	-	-	-
G1AC4F20	Introduction to entrepreneurship	DC	47	-	-	-	-	-	-	1	1	-	-	C	3

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CURRICULUM

Academic year 2025-2026
Year III

Code	Subject	Course status	S.I./ Sem (hrs)	Hours per week and Evaluation type											
				1st Semester 14 weeks						2st Semester 14 weeks					
				C	S	L	Pr	Ev	C	C	S	L	Pr	C	K
COMPULSORY COURSES															
GlAF5O01	Artificial Intelligence	DF	83	2	-	1	-	Ex	5	-	-	-	-	-	-
GlAS5O02	Advanced programming methods	DS	69	2	-	2	-	Ex	5	-	-	-	-	-	-
GlAS5O03	Numerical calculation	DS	58	2	-	1	-	Ex	4	-	-	-	-	-	-
GlAS6O04	Software engineering	DS	94	-	-	-	-	-	-	2	-	2	-	Ex	6
GlAS6O05	Advanced programming techniques	DS	94	-	-	-	-	-	-	2	-	2	-	Ex	6
GlAC6O06	Ethics and academic integrity	DC	36							1	-	-	-	C	2
GlAS6O07	Writing and Editing the Diploma Thesis	DS	41	-	-	-	-	-	-	-	-	6	-	C	5
	TOTAL			**6**	**-**	**4**	**-**	**-**	**14**	**5**	**-**	**10**	**-**	**-**	**19**
ELECTIVE COURSES															
	Package 1														
GlAC5A08	Scientific and professional writing and communication	DC	58	2	-	1	-	C	4	-	-	-	-	-	-
GlAC5A09	Business concepts in IT	DC	58	2	-	1	-	C	4	-	-	-	-	-	-
	Package 2														
GlAS5A10	Operational Research	DS	58	2	-	1	-	C	4	-	-	-	-	-	-
GlAS5A11	Computational Geometry	DS	58	2	-	1	-	C	4	-	-	-	-	-	-
	Package 3														
GlAS5A12	Computer Graphics	DS	58	2	-	1	-	Ex	4	-	-	-	-	-	-
GlAS5A13	Programming environments and tools	DS	58	2		1		Ex	4						
	Package 4														
GlAS5A14	Cryptography	DS	58	2	-	1	-	Ex	4	-	-	-	-	-	-
GlAS5A15	Logical programming	DS	58	2	-	1	-	Ex	4	-	-	-	-	-	-
	Package 5														
GlAS6A16	Computer Science project management	DS	94	-	-	-	-	-	-	2	-	2	-	Ex	6
GlAS6A17	Parallel, concurrent and distributed programming	DS	94	-	-	-	-	-	-	2	-	2	-	Ex	6
	Package 6														
GlAS6A18	Optimization Techniques	DS	83	-	-	-	-	-	-	2	-	1	-	C	5
GlAS6A19	Modeling and simulation	DS	83	-	-	-	-	-	-	2	-	1	-	C	5
	TOTAL			**8**	**-**	**4**	**-**	**-**	**16**	**4**	**-**	**3**	**-**	**-**	**11**
TOTAL				**14**	**-**	**8**	**-**	**-**	**30**	**9**	**-**	**13**	**-**	**-**	**30**
FACULTATIVE COURSES															
GlAC5F20	Professional Ethics and Intellectual Property (Legal Informatics)	DC	22	1	1	-	-	C	2	-	-	-	-	-	-
GlAC5F21	Entrepreneurship – economic and financial aspects	DC	47	1	1	-	-	C	3	-	-	-	-	-	-
GlAS6F22	Mathematical modeling	DS	83	-	-	-	-	-	-	2	1	-	-	Ex	5

GlAC6F23	Business Management	DC	47	-	-	-	-	-	-	1	1	-	-	C	3

The student who has accumulated the **184** credits by promoting the three-year bachelor's degree obtains a Graduate Certificate in Computer Science (without a bachelor exam).

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

The student who has accumulated the **194** credits by promoting the three years of Bachelor's degree studies and the Bachelor's Degree exam earns a Bachelor's Degree in Computer Science.

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