ANEXA 1

SYLLABUS

University year 2023-2024
Year of Study 2/ Semester 2

1. Information on academic programme

1.1. University	**„1 Decembrie 1918" Alba Iulia**
1.2. Faculty	**Faculty Of Exact Sciences and Engineering**
1.3. Department	**Informatics, Mathematics and Electronics**
1.4. Field of Study	**Computer Science**
1.5. Cycle of Study	**undergraduate**
1.6. Academic programme / Qualification	**Computer Science, 251201, 251204, 251203**

2. Information of Course Matter

2.1. **Course**		*Formal languages and automata*			2.2. **Code**		CSE 209
2.3. **Course Leader**			Lect. Dr. Oroian-Boca Maria Loredana				
2.4. **Seminar Tutor**			Asist. Drd. Cristea Daniela				
2.5. Academic Year	**II**	2.6. Semester	**II**	2.7. Type of Evaluation (E – final exam/ CE - colloquy examination / CA -continuous assessment)	**CE**	2.8. Type of course (**C**– Compulsory, **Op** – optional, **F** - Facultative)	**O**

3. Course Structure (Weekly number of hours)

3.1. Weekly number of hours	*4*	3.2. course	***2***	3.3. seminar, laboratory	***2***
3.4. Total number of hours in the curriculum	*56*	3.5. course	***28***	3.6. seminar, laboratory	***28***

Allocation of time:	Hours
Individual study of readers	***20***
Documentation (library)	***10***
Home assignments, Essays, Portfolios	***10***
Tutorials	
Assessment (examinations)	***4***
Other activities…….	**-**

3.7 Total number of hours for individual study	44
3.9 Total number of hours per semester	100
3.10 Number of ECTS	4

4. Prerequisites (*where applicable*)

4.1. curriculum-based	***1. Mathematical base of computers***
4.2. competence-based	***C4. Using the theoretical foundations of computer science and formal models***

5. **Requisites** (*where applicable*)

5.1. course-related	Room equipped with video projector / board
5.2. seminar/laboratory-based	*Laboratory – computer, Software: UML Diagrams, Internet access.*

6. **Specific competences to be aquired (chosen by the course leader from the programme general competences grid)**

Professional competences	*C4.1 The definition of base concepts and principles of computer science and mathematics as well as of the mathematical theories and models.* *C4.2 The interpretation of mathematical and computer science (formal) models.* *C4.3 The identification of appropriate models and methods for solving real-life problems.* *C4.4 The use of simulation in the study of the behavior of developed models and evaluation of results.* *C4.5 The embedding of formal models in specific applications in various domains.*
Transversal competences	

7. Course objectives (as per the programme specific competences grid)

7.1 General objectives of the course	*Acquiring fundamental knowledge on the concept of mathematical modeling, the mathematical models, deterministic scheduling and implementation of a computer language;*
7.2 Specific objectives of the course	*Formation of complex problem solving skills required in the interpretation of the expressions and instructions of a programming language and the implementation of a program to implement that language.*

8. Course contents

8.1 Course (learning units)	**Teaching methods**	**Remarks**
1. Getting the necessary mathematical theory of formal languages	***Lecture, conversation, exemplification***	**Course 1 – 2**
2. Grammars and formal languages	***Lecture, conversation, exemplification***	**Course 3 – 4**
3. Finite machines	***Lecture, conversation, exemplification***	**Course 5 – 6**
4. Regular expressions	***Lecture, conversation, exemplification***	**Course 7 – 8**
5. Grammars and regular languages	***Lecture, conversation, exemplification***	**Course 9 – 10**
6. Context free grammars and languages	***Lecture, conversation, exemplification***	**Course 11 – 12**
7. Elements of the theory of compilation	***Lecture, conversation, exemplification***	**Course 13 - 14**
Seminars-laboratories	**Teaching methods**	
	Project-work, computer-based activities, laboratory activities	
1. Complements of Mathematics	***laboratory activities***	**S1 – 2**

2. Organization and problem solving grammar	***laboratory activities***	**S3 – 5**
3. Achieving finite automata	***laboratory activities***	**S6 – 8**
4. Applications of regular expressions	***laboratory activities***	**S9 – 11**
5. Applications with context-free grammars and languages	***laboratory activities***	**S12 – 14**

References

1. **Formal Language & Automata Theory. First Edition: 2007 - 2008 – A. A. Puntambekar – Technical Publications Pune, Amit Residency, 412, Shaniver Peth, Pune, India.**
2. **Formal Language and Automata Theory – K. V. N. Sunitha, N. Kalyani – Typeset at Bukprint, India.**
3. **Theory of Automata & Formal Languages – A. M. Natarajan, A. Tamilarasi, P. Balasubramani – New Age International Publishers.**
4. **Gr. Moldovan – Limbaje Formale şi Teoria Automatelor – EduSoft – 2005.**
5. **Gr. Moldovan - Limbaje formale şi tehnici de compilare – Univ. Babeş-Bolyai Cluj-Napoca – 2002.**
6. **Gh. Păun – Gramatici contextuale – Ed. Academiei, Bucureşti, 1982.**

9. Corroboration of course contents with the expectations of the epistemic community's significant representatives, professional associations and employers in the field of the academic programme

Advanced data modeling methodologies, regression models, mathematical programming models, deterministic models, model quality assessment

10. Assessment

Activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course	*Final evaluation*	*Written paper*	60%
	-	-	-
10.5 Seminar/laboratory	*Continuous assessment*	*Laboratory activities portfolio*	40%
	-		-
10.6 Minimum performance standard:			
Knowledges about grammar, regular expressions and languages			

Submission date _____

Course leader signature Oroian-Boca Maria Loredana

Seminar tutor signature Cristea Daniela

Date of approval by Department members _____

Departmental head signature _____

Date of approval by Faculty Council _____

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