

SYLLABUS

University year 2024-2025
Year of Study 2/ Semester 2

1. Information on academic programme

1.1. University	„1 Decembrie 1918” Alba Iulia
1.2. Faculty	Faculty of Informatics 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, ESCO-08: 2511/ Systems Analyst, 2512/ Software developers Analyst 251201 Computer System Programmer 251204 Computer System Engineer 251203

2. Information of Course Matter

2.1. Course		<i>Formal languages and automata</i>		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)	E	2.8. Type of course (C – Compulsory, Op – optional, F - Facultative)	C

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
3.8 Total number of hours in the curriculum	56
3.9 Total number of hours per semester	100
3.10 Number of ECTS	4

4. Prerequisites (*where applicable*)

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

5. Requisites (*where applicable*)

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

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

Professional competences	<i>The use of computer tools in an interdisciplinary context The use of the theoretical basis of computer science and of formal models Design and management of databases</i>
Transversal competences	

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

7.1 General objectives of the course	<i>Acquiring fundamental knowledge on the concept of mathematical modeling, the mathematical models, deterministic scheduling and implementation of a computer language;</i>
7.2 Specific objectives of the course	<i>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.</i>

8. Course contents

8.1 Course (learning units)	Teaching methods	Remarks
1. Getting the necessary mathematical theory of formal languages	<i>Lecture, conversation, exemplification</i>	Course 1 – 2
2. Grammars and formal languages	<i>Lecture, conversation, exemplification</i>	Course 3 – 4
3. Finite machines	<i>Lecture, conversation, exemplification</i>	Course 5 – 6
4. Regular expressions	<i>Lecture, conversation, exemplification</i>	Course 7 – 8
5. Grammars and regular languages	<i>Lecture, conversation, exemplification</i>	Course 9 – 10
6. Context free grammars and languages	<i>Lecture, conversation, exemplification</i>	Course 11 – 12
7. Elements of the theory of compilation	<i>Lecture, conversation, exemplification</i>	Course 13 - 14

Seminars-laboratories	Teaching methods	
	<i>Project-work, computer-based activities, laboratory activities</i>	
1. Complements of Mathematics	<i>laboratory activities</i>	S1 – 2
2. Organization and problem solving grammar	<i>laboratory activities</i>	S3 – 5
3. Achieving finite automata	<i>laboratory activities</i>	S6 – 8
4. Applications of regular expressions	<i>laboratory activities</i>	S9 – 11
5. Applications with context-free grammars and languages	<i>laboratory activities</i>	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. **An introduction to formal language and automata, Fifth edition, Peter Linz, 2011**
5. **Formal Language And Automata Theory, Singh Ajit, 2019**

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	<i>Final evaluation</i>	<i>Written paper</i>	60%
	-	-	-
10.5 Seminar/laboratory	<i>Continuous assessment</i>	<i>Laboratory activities portfolio</i>	40%
	-	-	-
10.6 Minimum performance standard:			
<i>Knowledges about grammar, regular expressions and languages</i>			

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

Dean signature
