



## SYLLABUS

### 1. Study programme

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	Informatics
1.5.Study level	2024-2025
1.6.Ciclu de studii	Bachelor
1.7.Study programme / Qualification	Computer Science (in English)
1.8.Form of education	Full – Time study

### 2. Course details

2.1. Name of the course	Computers architecture
2.2. Course coordinator	Conf.dr. Ing. Cornel Barna
2.3. Seminar/laboratory/project coordinator	As. Antonio Lututiu
2.4. Study year	I
2.5. Semester	I
2.6. Evaluation type	Exam
2.7. Course type	Mandatory

### 3. Estimated total time (hours per semester)

3.1.Hours per week	4
3.2.Lecture hours per week	2
3.3.Seminar/laboratory/project hours per week	2
3.4. Total hours per curriculum	56
3.5.Lecture hours per semester	28
3.6.Seminar/laboratory/project hours per semester	28
Time division[hrs]	
3.4.1.Independent study from textbooks, course support, bibliography and notes	30
3.4.2.Additional reading (libraries, specialized electronic platforms and field research)	20
3.4.3.Preparing of seminars/laboratories/projects, homework, papers, portfolios and essays	30
3.4.4.Tutorial coaching	5
3.4.5.Examinations	3
3.4.6.Other activities	6
3.7. Total individual study hours	94
3.8.Total hours per semester	150
3.9.Number of ECTS credits	6

### 4. Prerequisites (if applicable)

4.1.Curriculum related	Notions of electronics
4.2.Competence related	Average computer skills

### 5. Conditions (if applicable)

5.1.for the lecture	Lecture room, equipped with laptop, video projector and appropriate software.
5.2.for the seminar	
5.3.for the laboratory	Appropriately equipped laboratory: computers, network, Internet connection, specialized software.
5.4.for the project	

#### 6. Specific educational objectives (competences to be acquired)

6.1.Competențe profesionale	<b>C1. Notions of electronics</b> <b>C2. Development of technical skills</b> <b>C3 Use of computer tools in an interdisciplinary context</b> <b>C4 Use of the theoretical bases of computer science</b> <b>C5. Designing logic circuits</b> <b>C6. Block diagram design</b>
6.2.Competențe transversale	<b>CT1 The application of the rules of organized and efficient work, of responsible attitudes towards the didactic-scientific field, for the creative exploitation of one's own potential, in compliance with the principles and norms of professional ethics;</b> <b>CT2 Effectively carrying out activities organized in an inter-disciplinary group and developing empathetic capacities for interpersonal communication, relating and collaborating with diverse groups;</b> <b>CT3 The use of effective methods and techniques for learning, information, research and development of the capacities to capitalize on knowledge, to adapt to the requirements of a dynamic society and to communicate in an internationally used language.</b>

#### 7. Course outcomes (resulting from the specific educational objectives to be acquired)

7.1. General outcomes	<b>Understanding the notions of logic circuits;</b> <b>Formation of design skills of computer system components;</b> <b>Knowledge of computer equipment design methods;</b> <b>Training skills to use machine code;</b>
7.2.Specific outcomes	Students will know how it works and what are the steps of designing digital subassemblies Students will know how to foresee the creation of information processing units from the specification and design phase Students will know how to use the tools for simulating logic circuits. Students will know how to design processing unit instances for different instruction sets.

#### 8. Outline(if applicable)

8.1Lecture Outline	Teaching methods	Remarks
1. Introduction. Brief history of the development of computer architecture 2. Basics. Number bases. Base operations 3. Logic gates. The basics of Boolean algebra. 4. Techniques for minimizing logic circuits 5. Design of decoders and multiplexers 6. Memory and bus design 7. Logic and arithmetic unit design 8. Design of registers 9. Designing counters 10. Design of execution units 11. Design of microprogrammed systems 12. Microprogrammed control memory design 13. Control memory optimization 14. Recapitulation in synthesis of the exposed themes	Exposition, description, explanations, examples, dialogue	2 hours/course
8.2Lecture References		
1. M.Cocan, B Pop Bazele matematice ale sistemelor de calcul Ed.Albastră 2002 2. J Yarbrough Digital Logic, Ed.West Publ.Co 1997 3. M.Murdocca Principles of Computer Arhitectuire Ed.Prentice Hall 1999 4. D .Patterson,J.Hennessy: Organizarea și proiectarea calculatoarelor Editura All 2002		
8.3Seminar Outline	Teaching methods	Remarks
8.4SeminarReferences		
8.5Laboratory Outline	Teaching methods Example on the computer. Functionality testing.	Remarks <b>2 hours/course</b>
8.6Laboratory Outline	Same like 8.2	
8.7Project Outline	Teaching methods	Remarks
8.8Project Outline		

of the program

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**10. Evaluation / Grading**(if applicable)

Activity type	Evaluation criteria	Evaluation methods	Percent age of the final grade
10.1.Lecture	<b>Knowledge Understanding</b>	Written work	60%
10.2. Seminar			
10.3. Laboratory	Knowledge and understanding Ability to explain and interpret Complete and correct resolution of requirements	Application activities / practical works Tests throughout the semester	40%
10.4.Project			
10.5Minimal performance standard			
<b>The student knows what the main concepts are, recognizes them, defines them correctly and builds a simple application;</b>			
<b>The specialized language is simple, but correctly used;</b>			
<b>Minimum grade 5 in the laboratory;</b>			
<b>Solve well a minimum of subjects - questions and applications.</b>			

Course coordinator  
Conf.univ.dr.Cornel Barna

Seminar/laboratory/project  
coordinator  
Conf.univ.dr.Cornel Barna

Head of the Department  
Lect.univ.dr.Lorena Camelia POPA

Dean  
Prof.univ.dr.Sorin-Florin NĂDĂBAN