Universitatea Naţională de Ştiinţă şi Tehnologie Politehnica Bucureşti
Facultatea de Electronică, Telecomunicaţii şi
Tehnologia Informaţiei

COURSE DESCRIPTION

1. Program identification information

1.1 Higher education institution	**National University of Science and Technology Politehnica Bucharest**
1.2 Faculty	**Electronics, Telecommunications and Information Technology**
1.3 Department	**Electronic Devices, Circuits and Architectures**
1.4 Domain of studies	Electronic Engineering, Telecommunications and Information Technology
1.5 Cycle of studies	Bachelor/Undergraduate
1.6 Programme of studies	Microelectronics, Optoelectronics and Nanotechnologies

2. Date despre disciplină

2.1 Course name (ro) (en)				Arhitectura sistemelor de calcul - Proiect Computer Systems Architecture - Project			
2.2 Course Lecturer				NA			
2.3 Instructor for practical activities				S.l./Lect. Dr. Ing. Mihai Antonescu			
2.4 Year of studies	4	2.5 Semester	I	2.6. Evaluation type	V	2.7 Course regime	Op
2.8 Course type		S	2.9 Course code	04.S.07.A.410		2.10 Tipul de notare	Nota

3. Total estimated time (hours per semester for academic activities)

3.1 Number of hours per week	1	Out of which: 3.2 course	0.00	3.3 seminary/laboratory	1
3.4 Total hours in the curricula	14	Out of which: 3.5 course	0	3.6 seminary/laboratory	14
Distribution of time:					hours
Study according to the manual, course support, bibliography and hand notes Supplemental documentation (library, electronic access resources, in the field, etc) Preparation for practical activities, homework, essays, portfolios, etc.					28
Tutoring					6
Examinations					2
Other activities (if any):					0

3.7 Total hours of individual study	36.00
3.8 Total hours per semester	50
3.9 Number of ECTS credit points	2

4. Prerequisites (if applicable) (where applicable)

4.1 Curriculum	Parcurgerea următoarelor discipline: - Computer Programming - Digital Integrated Circuits
4.2 Results of learning	Acumularea următoarelor cunoştinţe: - Programming in the C language - Fundamental notions about digital circuits

5. Necessary conditions for the optimal development of teaching activities (where applicable)

5.1 Course	Not applicable
5.2 Seminary/ Laboratory/Project	The project will take place in a room with specific equipment, which must include computers and experimental platforms equipped with Xilinx FPGAs.

6. General objective *(Reffering to the teachers' intentions for students and to what the students will be thought during the course. It offers an idea on the position of course in the scientific domain, as well as the role it has for the study programme. The course topics, the justification of including the course in the currcula of the study programme, etc. will be described in a general manner)*

This course aims to deepen the concepts studied within the CID course (year 2, semester 2) and is intended for students interested in the field of digital systems design. Thus, it will pursue understanding the operation and the design of a computer system consisting of a central processing core (MicroBlaze, ARM) and peripherals capable of performing certain functions.

7. Competences *(Proven capacity to use knowledge, aptitudes and personal, social and/or methodological abilities in work or study situations and for personal and proffesional growth. They refflect the empolyers requirements.)*

Specific Competences	- Description of the operation of digital electronic circuits and systems. - Knowledge of the principles and methods for designing and testing digital integrated circuits, components of a computer system. Analysis of medium-complexity digital electronic circuits and systems, for the purpose of designing and simulating their operation.
Transversal (General) Competences	Capacity for analysis and synthesis

8. Learning outcomes *(Synthetic descriptions for what a student will be capable of doing or showing at the completion of a course. The learning outcomes reflect the student's acomplishments and to a lesser extent the teachers' intentions. The learning outcomes inform the students of what is expected from them with respect to performance and to obtain the desired grades and ECTS points. They are defined in concise terms, using verbs similar to the examples below and indicate what will be required for evaluation. The learning outcomes will be formulated so that the correlation with the competences defined in section 7 is highlighted.)*

Knowledge	*The result of knowledge aquisition through learning. The knowledge represents the totality of facts, priciples, theories and practices for a given work or study field. They can be theoretical and/or factual.* The operating principles of a computer system consisting of a central processing core and peripherals.

Skills	*The capacity to apply the knowledge and use the know-how for completing tasks and solving problems. The skills are described as being cognitive (requiring the use of logical, intuitive and creative thinking) or practical (implying manual dexterity and the use of methods, materials, tools and intrumentation).* Structuring a digital system starting from the function it must perform. Decisions on the optimal design option, taking into account the target application.
Responsability and autonomy	*The student's capacity to autonomously and responsably apply their knowledge and skills.* Ability to go from a natural-language statement to a solution. Ability to evaluate a designed digital system.

9. Teaching techniques *(Student centric techniques will be considered. The means for students to participate in defining their own study path, the identification of eventual fallbacks and the remedial measures that will be adopted in those cases will be described.)*

The main teaching methods are lecture, explanation, demonstration, conversation, and exercise. During the project sessions, students are guided in analyzing, interpreting, and understanding the project specification and in designing the target system based on it.

10. Contents

PROJECT		
Crt. no.	**Content**	**No. hours**
1	Familiarization with the working environment (software and/or hardware) and with the project specification.	2
2	Analysis of the system components and how they interact	2
3	Design and implementation of the system according to the requirements	8
4	Final presentation	2
	Total:	14
Bibliography:		

11. Evaluation

Activity type	11.1 Evaluation criteria	11.2 Evaluation methods	11.3 Percentage of final grade
11.4 Course			
11.5 Seminary/laboratory/project	- Knowledge of the fundamental notions of digital circuits. - Understanding the specification and implementing the system so that it meets all requirements.	Oral evaluation	100
11.6 Passing conditions			
Obtaining at least 50% of the total score.			

12. Corroborate the content of the course with the expectations of representatives of employers and representative professional associations in the field of the program, as well as with the current state of knowledge in the scientific field approached and practices in higher education institutions in the European Higher Education Area (EHEA)

The course addresses the main theoretical and practical elements necessary for designing small- and medium-complexity digital systems using the SystemVerilog language, providing certain skills that can be considered advantages for students' employment in companies specialized in digital design.

Date	Course lecturer	Instructor(s) for practical activities
	NA	S.l./Lect. Dr. Ing. Mihai Antonescu

Date of department approval	Head of department
	Prof. Dr. Claudius Dan

Date of approval in the Faculty Council	Dean
	Prof. Dr. Ing. Radu-Mihnea Udrea