



## SYLLABUS

<b>Basic information of the course</b>	
<b>University:</b>	<b>University “Ukshin Hoti” - Prizren</b>
<b>Academic unit:</b>	<b>Faculty of Computer Science</b>
<b>Study program:</b>	<b>Information Technologies and Telecommunication</b>
<b>Course:</b>	<b>Digital Technology</b>
<b>Study level:</b>	<b>Bachelor</b>
<b>Course status:</b>	<b>Mandatory</b>
<b>Study year:</b>	<b>1</b>
<b>Number of hours per week:</b>	<b>2+2</b>
<b>Credit value - ECTS:</b>	<b>6</b>
<b>Time / location:</b>	<b>It will be published in the university web site!</b>
<b>Lecturers:</b>	<b>Assoc. Prof. Dr. Samedin Krrabaj Ass. Arbër Beshiri, Ph. D. c.</b>
<b>Contact details:</b>	<b>samedin.krrabaj@uni-prizren.com arber.beshiri@uni-prizren.com</b>
<b>Course description:</b>	The course provides basic concepts about designing logic circuits, logic components and truth tables, flip-flops and sequential circuits, and principles for automating and designing circuits as a whole. It elaborates sufficiently the principles of digital systems, combinational and sequential circuits and their implementation in practice. This course also introduces basic concepts about automation and design of logic circuits using the basics of digital electronics.
<b>Course objectives:</b>	<p>Through this course, it is possible for students to recognize the key elements of digital technology and systems and expanded capabilities that can be provided through system synergies and their functionality.</p> <ul style="list-style-type: none"> <li>- The course analyzes and explains the concepts and principles of digital systems and technologies.</li> <li>- The analytical approach supports the basic concepts and skills needed to analyze and design logical and sequential circuits.</li> </ul>

	<ul style="list-style-type: none"> <li>- This enables the understanding of the principles of digital design; realization of combinatorial, logical and sequential circuits; logic design basics and their automation.</li> </ul>		
<b>Learning outcomes:</b>	After completing this course the students will be able to: <ul style="list-style-type: none"> <li>- Understand the basic concepts of digital systems and technologies.</li> <li>- Understand logical, sequential, combinatorial circuits, etc.</li> <li>- Understand and apply the realization of logical, combinatorial, sequential circuits and their logical design.</li> </ul>		
<b>Contribution on student load (must correspond with learning outcomes)</b>			
<b>Activity</b>	<b>Hours</b>	<b>Days/week</b>	<b>Total/hours</b>
Lectures	2	15	30
Exercise theoretical/laboratory	2	15	30
Practice work	1	2	2
Contact with lecturer/consultations	1	5	5
Field exercises	1	1	1
Midterms	2	2	4
Laboratory exercises	2	2	4
Individual time spent studying (at the library or home)	3	10	30
Final preparation for the exam	5	6	30
Time spent in evaluation (tests, quiz, final exam)	2	3	6
Projects, presentations, etc.	4	2	8
<b>Total</b>			<b>150</b>
Notice: 1 ECTS credits = 25 hours commitment, e.g. if the course has 6 ECTS credits student must have 150 hours during the semester.			
<b>Teaching methods:</b>	The course is a combination of lectures, discussions, numerical and laboratory exercises, while the assignments are presented by the laboratory course lecturers!		
<b>Assessment methods:</b>	<ul style="list-style-type: none"> <li>- Attendance in lectures and exercises: 5% + 5%.</li> <li>- Semestral project: 15%.</li> <li>- Midterm 1: 35%.</li> <li>- Midterm 2: 40%.</li> <li>- Or final exam: 100%.</li> </ul>		

<b>Assessment and grading:</b>	<b>Vlerësimi në %</b>	<b>Nota përfundimtare</b>
	91% - 100%	10
	81% - 90%	9
	71% - 80%	8
	61% - 70%	7
	51% - 60%	6
	0% - 50%	5
<b>Literature</b>		
<b>Basic literature:</b>	<ol style="list-style-type: none"> <li>1. Morris M. Mano &amp; Mishael D. Ciletti. Digital Design, 6<sup>th</sup> Edition, Pearson, 2018.</li> <li>2. Agni Dika. Qarqet Kompjuterike Kombinuëse. Fakulteti Elektroteknik, Universiteti i Prishtinës, 2005.</li> </ol>	
<b>Additional literature:</b>	<ol style="list-style-type: none"> <li>1. Agim Çami. Bazat e Qarqeve Logjike. Tiranë, 2018.</li> <li>2. Charles H. Roth. Fundamentals of Logic Design. Jr., PWS Publishing Company, 7<sup>th</sup> Edition, Cengage Learning, 2013.</li> <li>3. Parag K. Lala. Principles of Modern Digital Design. John Wiley &amp; Sons, Inc., Hoboken, New Jersey, 2007.</li> </ol>	
<b>Study plan</b>		
<b>Week</b>	<b>Lectures</b>	
<i>First week:</i>	<ul style="list-style-type: none"> <li>• Introduction to course organization - syllabus (about lectures).</li> <li>• Numerical systems.</li> </ul>	
<i>Second week:</i>	<ul style="list-style-type: none"> <li>• Conversion of binary, octal, decimal and hexadecimal numbers.</li> </ul>	
<i>Third week:</i>	<ul style="list-style-type: none"> <li>• Arithmetic of binary, octal and hexadecimal numbers.</li> <li>• Complementary arithmetic.</li> </ul>	
<i>Fourth week:</i>	<ul style="list-style-type: none"> <li>• Codes <ul style="list-style-type: none"> <li>○ BCD Codes</li> <li>○ Cyclic Codes</li> </ul> </li> <li>• Optimal codes</li> </ul>	
<i>Fifth week:</i>	<ul style="list-style-type: none"> <li>• Codes <ul style="list-style-type: none"> <li>○ Security codes</li> <li>○ Error detection codes</li> </ul> </li> <li>• Codes for correcting mistakes</li> </ul>	
<i>Sixth week:</i>	<ul style="list-style-type: none"> <li>• Boolean algebra.</li> </ul>	
<i>Seventh week:</i>	<ul style="list-style-type: none"> <li>• Combination circuits.</li> </ul>	

<i>Eighth week:</i>	<ul style="list-style-type: none"> <li>• First midterm.</li> </ul>
<i>Ninth week:</i>	<ul style="list-style-type: none"> <li>• Coders.</li> </ul>
<i>Tenth week:</i>	<ul style="list-style-type: none"> <li>• Decoders.</li> </ul>
<i>Eleventh week:</i>	<ul style="list-style-type: none"> <li>• Code convertors.</li> <li>• Indicators.</li> </ul>
<i>Twelfth week:</i>	<ul style="list-style-type: none"> <li>• Multiplexers.</li> <li>• Demultiplexers.</li> </ul>
<i>Thirteenth week:</i>	<ul style="list-style-type: none"> <li>• Comparators.</li> <li>• Arithmetic circuits.</li> </ul>
<i>Fourteenth week:</i>	<ul style="list-style-type: none"> <li>• Simulation of combined logical circuits.</li> <li>• Sequential circuits.</li> <li>• Registers and counters.</li> </ul>
<i>Fifteenth week:</i>	<ul style="list-style-type: none"> <li>• Second (final) midterm.</li> </ul>

### Exercises

Study plan	
Java	Exercises
<i>First week:</i>	<ul style="list-style-type: none"> <li>• Introduction to course organization – syllabus (about exercises).</li> <li>• Numerical systems.</li> </ul>
<i>Second week:</i>	<ul style="list-style-type: none"> <li>• Conversion of binary, octal, decimal and hexadecimal numbers.</li> </ul>
<i>Third week:</i>	<ul style="list-style-type: none"> <li>• Arithmetic of binary, octal and hexadecimal numbers.</li> <li>• Complementary arithmetic.</li> </ul>
<i>Fourth week:</i>	<ul style="list-style-type: none"> <li>• Codes <ul style="list-style-type: none"> <li>○ BCD codes.</li> <li>○ Cyclic codes.</li> </ul> </li> <li>• Optimal codes.</li> </ul>
<i>Fifth week:</i>	<ul style="list-style-type: none"> <li>• Codes <ul style="list-style-type: none"> <li>○ Security codes.</li> <li>○ Error detection codes.</li> </ul> </li> <li>• Codes for correcting mistakes.</li> </ul>
<i>Sixth week:</i>	<ul style="list-style-type: none"> <li>• Boolean algebra.</li> </ul>
<i>Seventh week:</i>	<ul style="list-style-type: none"> <li>• Combination circuits.</li> </ul>
<i>Eighth week:</i>	<ul style="list-style-type: none"> <li>• Consultations about midterm 1.</li> </ul>
<i>Ninth week:</i>	<ul style="list-style-type: none"> <li>• Coders.</li> </ul>
<i>Tenth week:</i>	<ul style="list-style-type: none"> <li>• Decoders.</li> </ul>
<i>Eleventh week:</i>	<ul style="list-style-type: none"> <li>• Code convertors.</li> <li>• Indicators.</li> </ul>
<i>Twelfth week:</i>	<ul style="list-style-type: none"> <li>• Multiplexers.</li> <li>• Demultiplexers.</li> </ul>
<i>Thirteenth week:</i>	<ul style="list-style-type: none"> <li>• Comparators.</li> </ul>

	<ul style="list-style-type: none"> <li>• Arithmetic circuits.</li> </ul>
<i>Fourteenth week:</i>	<ul style="list-style-type: none"> <li>• Simulation of combined logical circuits.</li> <li>• Sequential circuits.</li> <li>• Registers and counters.</li> </ul>
<i>Fifteenth week:</i>	<ul style="list-style-type: none"> <li>• Consultation about midterm 2.</li> </ul>

<b>Academic policies and rules of conduct</b>	
	<ul style="list-style-type: none"> <li>• Generally lecture presentations will be made through MS PowerPoint, tables, material usage, computer programs and numeric exercises.</li> <li>• Additional resources (scientific papers, publications, national bulletins, as well as recent discoveries and research) will be provided by professors.</li> <li>• In the absence of the opportunity for practical work to be organized weekly, in cooperation with the management of the university, this activity will be organized on certain days in: organizations, companies, etc.</li> <li>• During each session will be organized the conversation and co-participation with the students!</li> <li>• Students are required to be regular in lectures and exercises!</li> <li>• It will be evaluated when the students collaborate and participate in the lectures and course exercises!</li> <li>• Timely arrival in lectures and exercises is mandatory!</li> </ul>