Course Name : Logical circuits

Course Code	Course Type	Regular Semester	Lecture (hours/week)	Seminar (hours/week)	Lab. (hours/week)	Credits	ECTS
CMP 212	B	Spring	2.00	0.00	2.00	3.00	6.00

Lecturer	Luljeta Hoda, Msc
Assistant	Olsi Shehu, MSc
Course language	Albanian
Course level	Bachelor
Description	Basic knowledge of logical circuits and their functionality. Numerical systems including binary, octal and hexadecimal systems, Weight codes. Analyze and build the logical circuit for encoders, decoders, multiplexer, and demultiplexer. Introduction to Boolean algebra and how this theory is used for simplifying logical functions. Concept of combinational circuits, bistable, sequential circuits
Objectives	You will get to know the terminological concepts in digital electronics, as well as the advantages of digital transmission of signals; you will be able to clarify the measurement of the amount of information; you will know and distinguish numerical systems; you will explain and apply the conversion of numbers from a system numerical to the other; you will apply the arithmetic operations of the numerical system binary; you will recognize and understand the notation of numbers negative in binary form; you will know how to encode information in the form digital; you will clarify the binary codes for numerical and textual data
Core Concepts	The student will learn the different numerical bases and the transformation between them. The student will know Boolean algebra and applications in logical circuits. The student will understand, design and analyze combinatorial circuits The student will understand, design and analyze sequential circuits

Course Outline

Week	Topic
1	Numerical systems. Decimal - binary transformation and vice versa.
2	Octal and hexadecimal system. Binary-octal transformations, binary-hexadecimal transformation and vice versa
3	Arithmetic operations with binary numbers
4	Codes
5	Boolean algebra
6	Logic Circuits. Introduction to combinational circuits
7	Mid-term
8	Combinatorial circuits: Logical gates and their use and the truth tables. Application of logic gates in the design of Combinatorial circuits
9	Encoders and Decoders and their applications. Code converters
10	Multiplexer and its application
11	Introduction to sequential circuits
12	Flip-flops and their design. SR Flip-flop, JK and D flip-flop . Truth tables
13	Registers: Design and their applications
14	Registers: Design and their applications

15	Sequential synchronous circuits, their analysis.
16	Final Exam

Prerequisites	The student must attend the course at a minimum rate of 75%.
Literature	• Elektronika Digjitale dhe Mikroprocesorët -Jani Servini Zhaneta Servini
References	• Digital design :An introduction to the verilog hdl / M. Morris Mano, Michael D. Ciletti

Course Outcome

1	Studenti do të demonstrojë aftësi për të kuptuar logjikën, teorine, funksionin e kalimi si dhe algjebrën e Bulit
2	Studenti duhet të jetë i aftë të kuptojë dhe analizojë teorinë e grafeve
3	Studenti duhet të jetë i aftë të kuptojë dhe analizojë qarqet kombinatorike
4	Studenti duhet të jetë i aftë të kuptojë dhe analizojë qarqet sekenciale

Course Evaluation

In-term Studies	Quantity	Percentage
Midterms	1	20
Quizzes	0	0
Projects	1	20
Term Projects	0	0
Laboratory	0	0
Class Participation	1	20
Total in-term evaluation percent		**60**
Final exam percent		**40**
Total		**100**

ECTS Workload (Based on Student Workload)

Activities	Quantity	Duration (hours)	Total (hours)
Course duration (Including the exam week: 16x Total hours of the course)	16	4	64
Study hours outside the classroom (Preparation, Practice, etc.)	14	4	56
Duties	1	1	1
Midterms	1	14	14
Final Exam	1	15	15
Other	0	0	0
Total Work Load			**150**
Total Work Load / 25 (hours)			**6.00**
ECTS			**6.00**