COURSE PLAN

FIRST: BASIC INFORMATION

College	
College	: Karak College
Department	: Engineering Department

Course		
Course Title	: Digital Logic Circuit	
Course Code	: 020406121	
Credit Hours	: **3** (1 Theoretical, 2 Practical)	
Prerequisite	:	

Instructor					
Name	:				
Office No.	:				
Tel (Ext)	:				
E-mail	:				
Office Hours	:				
Class Times	Building	Day	Start Time	End Time	Room No.

Text Book

- Digital Logic Circuit, Al-Balqa Applied University & KOICA, 2022

References

1. Roger Tokheim, “Digital Electronics,” 8th Ed., McGraw-Hill, 2013.
2. M. Morris Mano & Charles R. Kime & Tom Martin, “Logic & Computer Design Fundamentals,” 5th Ed., Pearson, 2015.

SECOND: PROFESSIONAL INFORMATION

COURSE DESCRIPTION

This course explains the concept of Boolean logic that is the basis of digital circuits. It also handles how to design and analyze combinational and sequential circuits, which are the two main types of digital logic circuits based on Boolean logic.

COURSE OBJECTIVES

The objectives of this course are to enable the student to do the following:

- Explain the concept of digital and binary systems.
- Design and analyze combinational logic circuits.
- Explain Boolean algebra and basic properties of Boolean algebra.
- Simplify simple Boolean functions by using the basic Boolean properties.
- Design and analyze sequential logic circuits.

COURSE LEARNING OUTCOMES

By the end of the course, the students will be able to:

CLO1. Represent and operate numbers in different numerical bases
CLO2. Encode and decode binary code into hexadecimal, symbols, and numbers
CLO3. Represent logical functions into logical circuits using logic gates
CLO4. Simplify logical functions using Boolean algebra
CLO5. Use Karnaugh maps and Quine-McCluskey tabular techniques to get a minimal gate, two-level implementation
CLO6. Analyze and design modular combinatorial logic circuits
CLO7. Explain the structure and operation of basic flip flops and latches
CLO8. Explain counters and shift registers
CLO9. Design logic circuits using fundamental components
CLO10. Synthesis a state machine that performs a given function

COURSE SYLLABUS

Week	Topic	Topic Details	Related LO and Reference (Chapter)	Proposed Assignments
1	Numbers We Use in Digital Electronics	• Counting in Decimal and Binary. • Place Value. • Convert Binary to Decimal. • Convert Decimal to Binary.	CLO.1	
2	Numbers We Use in Digital Electronics	• Electronic Translators. • Hexadecimal Numbers. • Octal Numbers. • Bit, Byte, Nibble and Word.	CLO.2	
3	Logic Gates	• The AND Gate. • The OR Gate. • The Inverter and Buffer. • The NAND Gate. • The NOR Gate.	CLO.3	
4	Logic Gates	• The Exclusive OR Gate. • The Exclusive NOR Gate. • The NAND Gate as a Universal Gate. • Two Inputs Gates. • Convert Gates using inverter.	CLO.3	
5	Combining Logic Gates	• Using Boolean Expressions to construct circuits. • Drawing a Circuit from a Maxterm Boolean Expression.	CLO.4	
6	Combining Logic Gates	• Truth Tables and Boolean Expressions. • Simplifying Boolean Expressions. • Karnaugh Maps. • Quine–McCluskey Tabular Method	CLO.5	
7	Encoding, Decoding, and	• The 8421 BCD Code. • The Excess-3 Code. • The Gray Code.	CLO.6	

Week	Topic	Topic Details	Related LO and Reference (Chapter)	Proposed Assignments
	Seven-Segment Displays	• The ASCII Code. • Encoders and Decoders. • Seven-Segment LED Displays.		
8	**Mid Exam**			
9	Flip-Flops	• The R-S Flip-Flop. • The Clocked R-S Flip-Flop. • The D Flip-Flop. • The J-K Flip-Flop. • The T Flip-Flop	CLO.7	
10	Flip-Flops	• IC Latches. • Triggering Flip-Flops. • Schmitt Trigger. • Application: Latched Encoder-Decoder System.	CLO.7	
11	Counters	• Ripple Counters. • Mod-10 Ripple Counters. • Synchronous Counters. • Down Counters.	CLO.8	
12	Counters	• Self-Stopping Counters. • Counters as Frequency Dividers. • TTL IC Counters. • CMOS IC Counters.	CLO.8	
13	Shift Registers	• Serial-Load Shift Registers. • Parallel-Load Shift Registers. • A Universal Shift Register. • Using the 74194 IC Shift Register. • An 8-Bit CMOS Shift Register.	CLO.8	
14	Arithmetic Circuits	• Binary Multiplication, Binary Multipliers. • 2s Complement Notation, Addition, and Subtraction. • 2s Complement Adders/Subtractors.	CLO.9	
15	Sequential Circuits	• Definitions of Sequential Circuit. • Sequential Circuit Analysis. • Design Sequential Circuit.	CLO.10	
16	**Final Exam**			

COURSE LEARNING RESOURCES

This module will be taught using available resources including:

- Class lectures, lecture notes, assignments, quizzes, and exams designed to achieve the course objectives.
- Lectures and materials uploaded to the e-learning system.
- Student should read the material covered in class, complete assignments on time, participate in class discussions, and do whatever it takes to grasp the topics.

ONLINE RESOURCES

Any web site or tutorial that offers information about the basics and principles of power electronics analysis.

ASSESSMANT TOOLS

ASSESSMENT TOOLS	%
Projects and Quizzes	20
Mid Exam	30
Final Exam	50
TOTAL MARKS	100

THIRD: COURSE RULES

ATTENDANCE RULES

Attendance and participation are extremely important, and the usual University rules will apply. Attendance will be recorded for each class. Absence of 10% will result in a first written warning. Absence of 15% of the course will result in a second warning. Absence of 20% or more will result in forfeiting the course and the student will not be permitted to attend the final examination. Should a student encounter any special circumstances (i.e. medical or personal), he/she is encouraged to discuss this with the instructor and written proof will be required to delete any absences from his/her attendance records.

GRADING SYSTEM

The grading system for the Diploma Degrees in the Al-Balqa' Applied University is the total mark out of 100%

GRADE	POINTS
FAILED	0-49
PASSED	50-100

REMARKS

Copying assignments, quizzes, or exams from another student will not be tolerated.
Helping other students to cheat in any way or form will not be tolerated.
Excellent attendance is expected.
BAU policy requires the faculty member to assign 35 grade if a student misses 15% of the classes without a valid excuse.
If student miss a class, it is his responsibility to find out about any announcements or assignments he/she may have missed.
Participation in, and contribution to class discussions will affect the final grade positively.
Making any kind of disruption (side talks or mobile ringing) in the class is not allowed and it will affect student negatively.
Makeup exam should not be given unless there is a valid excuse according to BAU policies.

COURSE COORDINATOR

Course Coordinator:	**Department Head:**
Signature:	**Signature:**
Date:	**Date:**