Course Syllabus

Course ID	**902208**
Course Title	**Logic Circuits**
Prerequisite	**902208 Logic Circuits**
Time & Date	
Coordinator	-
Instructor	**Assistant. Prof. Dr. Takialddin Al-Smadi** Faculty of Engineering E-mail: dsmadi@rambler.ru Telephone: ext.
Office hours	
Course Description	Description: Introduction to Swiching logic and combinational circuits. Analysis of switching devices , minimation tschniques , number systems and codes and logic design of functional digital units are also included. Furthermore,the use of LSI in logic design ,an introduction to sequential circuits design of synchronous , asynchronous ,and pulse sequential circiuts , minimization of sequential circiuts and state assignment and covers are also involved.
Course Objectives	This is the first course in computer hardware design, which covers the fundamentals of the digital logic design and switching theory. During this course, the student is expected to learn the following concepts: - An overview of digital systems and their applications - Number systems, base conversion, and data representation using binary codes - Boolean algebra and its laws, theorems, and operations - Simplification of Boolean algebraic expressions - Converting a word description of a logic system behavior into an algebraic expression - Using Karnaugh Maps and Quinn-McLowski's techniques to minimize Boolean expressions. - Design and analysis of combinational logic networks and applications - Implementing logic functions using multiple-output networks such as Multiplexers, Decoders, Read-Only Memories, and Programmable Logic Arrays - The operation of the SR, JK, T, and D flip-flops as basic memory units - Design and analysis of synchronous sequential logic networks and applications
Course Outcomes	Upon completion of this course, the student should have the ability to: - Manipulate different numbering systems and convert from one base to the other. - Manipulate Boolean algebraic expressions and their graphical logical representations. - Use the Karnaugh maps and Quinn-McLowski's techniques minimize Boolean expressions. - Design an optimal combinational logic network for an application using logic gates, multiplexers, decoders,

ROMs, or PLAs given the truth table or a word description of the application.

- Design an optimal clocked synchronous sequential logic networks for an application using RS, JK, T, or D Flip-Flops given the state table, state diagram, or a word description of the application.

Course Topics

Course Content

Week	Topics	Chapter in Text
1	Course Introduction Introduction to digital systems and applications	
2 & 3	Binary Systems	1 (1-2;1-3;1-4;1-5;1-6; 1-7)
4, 5, & 6	Boolean Algebra and Logic Gates	2 (2-1;2-2;2-3;2-4;2-5;2-6;2-7)
6, 7, & 8	Gate-Level Minimization	3 (3-1;3-2;3-3;3-4;3-5;3-6;3-7;3-8)
9, 10 & 11	Combinational Logic	4 (4-1;4-2;4-3;4-4;4-5;4-6;4-7;4-8;4-9;4-10) Carry-look-ahead is not included
12, 13, & 14	Synchronous Sequential Logic	5 (5-1;5-2;5-3;5-4;5-7)
15 & 16	Registers and Counters	6 (6-1;6-2;6-3;6-4) Using register and counter for sequential design

Course Text Book

[-Logic Circuits
(ISBN: 0070840660)
Noel M. Morris: **McGraw-Hill Education, 1976**
2-Handbook of logic circuits
(ISBN: 0879093323)
John D Lenk: **Reston Pub. Co, 1972**
3-Fundamentals and applications of digital logic circuits
(ISBN: 0810455056)
Sol Libes: **Hayden Book Co 1975**
4-Logic Circuits
(ISBN: 0070840660) Morris, N. M: NY 1969,

Course References

- Digital Design – Principles and Practices, John F. Wakerly, Prentice Hall
- Computer Engineering Hardware Design, M. Morris Mano, Prentice Hall
  Fundamentals of Logic Design, Charles Roth, Jr., Brooks Cole

Course delivery

Lectures
Tutorial
Lab
Homework
Project
Computer
Internet
Industrial Visit

Course

Assessment	

Teaching & Learning Methods
▪ Class lectures, lecture notes, and assignments are designed to achieve the course objectives. ▪ You should attend and comprehend the material covered in class, complete assignments on time, participate in class discussions, and do whatever it takes for you to grasp the topics. ▪ You are responsible for all material covered in the class whether from the book, the lecture notes, or both, even when you are absent. ▪ Please communicate any concerns or issues as soon as possible either in the class, by phone or by email.

Updated	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12
CO1											
CO2											
CO3											
CO4											
CO5											
CO6											
CO7											
CO8											
CO9											

	a	b	C	D	e	f	g	h	i	j	K
CO1											
CO2											
CO3											
CO4											
CO5											
CO6											
CO7											
CO8											
CO9											

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ABET a-k Engineering and Technology program outcome

(a) An ability to apply knowledge of mathematics, science, and engineering
(b) An ability to design and conduct experiments, to analyze and interpret data
(c) An ability to design a system, component, or process to meet desired needs
(d) An ability to function on multi-disciplinary teams
(e) An ability to identify, formulate, and solve engineering problems
(f) An understanding of professional and ethical responsibility
(g) An ability to communicate effectively
(h) The broad education necessary to understand the impact of engineering solutions in a global and societal context
(i) A recognition of the need for, and an ability to engage in life-long learning
(j) A knowledge of contemporary issues
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Plagiarism

Deliberate plagiarism is a serious act of academic misconduct. Students may be suspended from the University if they are found to have plagiarized their course work. Whether inadvertent or deliberate, plagiarism includes the following:

(a) word-for-word copying of sentences or whole paragraphs or presenting of substantial extracts from either paper-based or electronic sources the work or data of others that are published or unpublished (such as books, internal reports, and lecture notes or tapes) without clearly indicating their origin;
(b) using very close paraphrasing of sentences or whole paragraphs without due acknowledgement in the form of reference to the original work;
(c) submitting another student's work in whole or in part;
(d) using of another person's ideas, work or research data without acknowledgement;
(e) copying computer files, algorithms or computer code without clearly indicating their origin;
(f) submitting work that has been written by someone else on the student's behalf; and
(g) submitting work that has been derived, in whole or in part, from another student's work by a process of mechanical transformation (e.g., changing variable names in computer programs).