



Course Specification

Course Name:[Logic Design]

Course Code:[CS221]

I. Basic Course Information

Major or minor element of program:[General]

Department offering the course:[Computer Science Department]

Academic level:[200 Level]

Semester in which course is offered:[First (fall) Semester]

Course pre-requisite(s): [IT112 (Electronics – 2)]

Credit Hours: 3

Contact Hours Through:

Lecture	Tutorial*	Practical*	Total
2.5	0.0	1.5	4.0

* 1.5 hours for **either** Tutorial or Practical

Approval date of course specification: September 2014

II. Overall Aims of Course

[Let the students to be familiar with the design of the logic circuits, including the design of computer components.
Also, the different techniques of designing the logic circuits will be handled.]

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
[K12, K13]	[I1, I5]	[P1]	[G2, G5, G6, G7]



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IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

On completing the course, students should be able to:

- K.1 Define common logic codes and their uses.
- K.2 Explain the primitive logic gates behaviors (and, or, not, nand, nor, xor).
- K.3 Recognize the approaches to construct the Boolean functions and the methods to simplify those using Boolean algebra rules, and K-maps.
- K.4 Design the combinational Circuits, and main types of Combinational Circuits, as Multiplexers, Demultiplexers, Encoders, and Decoders.
- K.5 Describe several types of latches and flip flops.
- K.6 Design the Sequential Circuits, and its main types (Registers, and Counters).]

b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

- I.1 Construct analysis and simplify combinational logic circuits.
- I.2 Construct analysis and simplify sequential logic circuits.
- I.3 Demonstrate the ability to understand the logic and the concepts behind the logic operation of any digital circuit.
- I.4 Develop a professional attitude and approach to the solution of technical problems in the digital logic problems.]

c. Practical/Professional Skills

On completing the course, students should be able to:

- P.1 Understanding the behaviour of the digital circuits.
- P.2 Demonstrate the principles of logic circuits design and implementation.
- P.3 Design the digital computer components.
- P.4 Construct Hardware controllers, and CPU components.

d. General and Transferable Skills

On completing the course, students should be able to:

- G.1 Use appropriate lab equipment and tools to design digital circuits such as combinational and sequential circuits.
- G.2 Work effectively in team.
- G.3 Develop skills related to creative thinking, problem solving.
- G.4 Develop skills of oral and written communication, and teamwork.]

V. Course Matrix Contents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	[Different types of logic codes and their uses.]	[1]	[K1]	[]	[]	[]
2-	[The primitive Logic Gates characteristics (and, or, not, nand, nor, xor ...).]	[1]	[K2]	[]	[]	[]
3-	[Boolean functions Simplification using Boolean Algebra.]	[2]	[K3]	[]	[]	[]
4-	[Boolean functions Simplification using K-maps]	[1]	[K3]	[]	[]	[]



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5-	[Combinational Circuits design.]	[1]	[K3]	[I1,I3,I4]	[All]	[All]
6-	[Multiplexers, DE multiplexers, Encoders, and Decoders.]	[2]	[K4]	[I1,I3,I4]	[All]	[All]
7-	[Sequential Circuits, and their types]	[1]	[K5]	[I2,I3,I4]	[All]	[All]
8-	[Different types of Latches, and Flip-Flops]	[2]	[K5]	[I2,I3,I4]	[All]	[All]
9-	[Registers and Counters.]	[2]	[K6]	[I2,I3,I4]	[All]	[All]
	Net Teaching Weeks	13				

VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours*
1	[Different types of logic codes and their uses.]	[2.5]	[2.5]	
2	[The primitive Logic Gates characteristics (and, or, not, nand, nor, xor ...).]	[4]	[2.5]	[1.5]
3	[Introduction to Boolean functions Simplification.]	[4]	[2.5]	[1.5]
4	[Boolean functions Simplification using Boolean Algebra]	[4]	[2.5]	[1.5]
5	[Boolean functions Simplification using K-maps]	[4]	[2.5]	[1.5]
6	[Combinational Circuits design.]	[4]	[2.5]	[1.5]
7	Midterm Exam			
8	[Multiplexers, DE multiplexers]	[4]	[2.5]	[1.5]
9	[Encoders, and Decoders]	[4]	[2.5]	[1.5]
10	[Sequential Circuits, and their types]	[4]	[2.5]	[1.5]
11	[Latches]	[4]	[2.5]	[1.5]
12	[Flip-Flops]	[4]	[2.5]	[1.5]
13	[Registers]	[4]	[2.5]	[1.5]
14	[Counters]	[4]	[2.5]	[1.5]
15	Final Exam			
Total Teaching Hours		51	33	18

* No Practical/Tutorial during the first week of the semester



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VII. Teaching and Learning Methods

Teaching/Learning Method	Selected Method	Course ILOs Covered by Method (By ILO Code)			
		K & U	Intellectual Skills	Professional Skills	General Skills
Lectures & Seminars	<input checked="" type="checkbox"/>	[All]	[]	[P1,P2]	[]
Tutorials	<input checked="" type="checkbox"/>	[All]	[I1,I2]	[]	[]
Computer lab Sessions	<input type="checkbox"/>	[]	[]	[]	[]
Practical lab Work	<input checked="" type="checkbox"/>	[]	[I3,I4]	[All]	[G1,G3]
Reading Materials	<input type="checkbox"/>	[]	[]	[]	[]
Web-site Searches	<input checked="" type="checkbox"/>	[]	[]	[P1,P2]	[]
Research & Reporting	<input type="checkbox"/>	[]	[]	[]	[]
Problem Solving / Problem-based Learning	<input checked="" type="checkbox"/>	[K3,K5]	[I4]	[]	[]
Projects	<input type="checkbox"/>	[]	[]	[]	[]
Independent Work	<input type="checkbox"/>	[]	[]	[]	[]
Group Work	<input checked="" type="checkbox"/>	[]	[I3,I4]	[]	[G2,G3,G4]
Case Studies	<input type="checkbox"/>	[]	[]	[]	[]
Presentations	<input type="checkbox"/>	[]	[]	[]	[]
Simulation Analysis	<input type="checkbox"/>	[]	[]	[]	[]
Others (Specify):	<input type="checkbox"/>	[]	[]	[]	[]

VIII. Assessment Methods, Schedule and Grade Distribution

Assessment Method	Selected Method	Course ILOs Covered by Method (By ILO Code)				Assessment Weight / Percentage	Week No.
		K & U	I.S.	P.S.	G.S.		
Midterm Exam	<input checked="" type="checkbox"/>	[K1,K2,K3,K4]	[I1,I2]	[P2]	[]	[10%]	7
Final Exam	<input checked="" type="checkbox"/>	[All]	[I1,I2]	[]	[]	60%	15
Quizzes	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Course Work	<input checked="" type="checkbox"/>	[All]	[I1,I2]	[]	[]	[10%]	[2→14]
Report Writing	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Case Study Analysis	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Oral Presentations	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Practical	<input checked="" type="checkbox"/>	[]	[All]	[All]	[G1]	[10%]	[2→14]
Group Project	<input checked="" type="checkbox"/>	[]	[]	[]	[G2,G3,G4]	[10%]	[]
Individual Project	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Others (Specify):	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]



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IX. List of References

Essential Text Books	• [M. Morris Mano, "Computer Engineering Hardware Design", Prentice-Hall International Editions.]
Course notes	• [None]
Recommended books	• [None]
Periodicals, Web sites, etc ...	• [None]

X. Facilities required for teaching and learning

[List the facilities required
• A prepared Digital Logic Design lab, containing logic gates ICs (Integrated Circuits), and connection wires.
• Recently published books
• Data show and well equipped classes]

Course coordinator: [Dr. Basheer Abd El-Fatah]

Head of Department:[Prof. Abeer El Korany]

Date: September 2014