University: *Fayoum University*
Faculty: *Computers and Information*
Department: *Basic Science*

Course Specification

1- Basic Information		
Code: CSC 261	**Course Title:** Logic Design	**Year/Level:** Second year – First term
Programme: B.Sc degree in Computer Science	**Number of units:** **Lecture:** 3 hrs/ week **Tutorial:** 0 hrs/ week **Practical:** 3 hrs/ week **Total:** 6 hrs/ week	

2- Aims of Course:	**On completion of this course the successful student will be able to:**
	1. Understand various numbering systems and codes 2. Be familiar with the different logic families and differentiate between the advantages and disadvantages of each of them 3. Understand the theorems and property of Boolean algebra which is the basis of logic design and use them to simplify any logic function 4. Understand how to use karnaugh maps to simplify any logic function with or without do not care terms 5. Design and analyze different combinational circuits 6. Understand different arithmetic circuits, encoders, decoders multiplexers and demultiplexers. 7. Study basic concepts of sequential circuits 8. Study different types of latches and flip-flops 9. Design and analyze sequential circuits and counters 10. Study ripple and synchronous up / down counters 11. Be familiar with different shift registers

3- Intended Learning Outcomes	
A- Knowledge and Understanding:	**On completing this course, students should have knowledge and understanding of :** **A3. Demonstrate the essential mathematics and physics relevant to computer science** **A4. Explain essential concepts, principles, and theories related to computer science such as operating system.** **A8. Express the main concepts of statistics, probability theory, algebra and numerical analysis and their role in the computing and information discipline.** **Through the following:** a1) Explain how the different series within the CMOS and TTL families differ from each other

	a2) Define propagation , delay time , power dissipation , speed-power product , and fan-out in relation to logic gates a3) List specific fixed-function integrated circuit devices that contain the various logic gates a4) Understand the operation of the NAND gate and the Nor gat
B- Intellectual Skills:	**On completion of this course the successful student will be able to:** B4. Apply solutions to a computer science problem, follow-up on solution to verify it, and if necessary restrict the solution methodologies upon the results. B5.Discuss factors other than computational efficiency that influence the choice of algorithms, such as programming time, maintainability, and the use of application-specific patterns in the input data. B8. Identify criteria to measure and interpret the appropriateness of a computer system for its current deployment and future evolution. **Through the following:** b1) Add numbers in hexadecimal form b2) Convert between the binary and octal numbers systems b3) Express decimal numbers in binary coded decimal (BCD) form b4) Add BCD numbers b5) Convert between the binary system and Gray code b6) Interpret the American Standard Code for information Interchange (ASCII) b7) Use binary numbers and codes in a system application.
C- Professional and Practical Skills:	**At the end of the course, the student will be able to:** C2. Negotiate effectively with clients, other stakeholders and peers. C5.Analyze simple and complicated electrical circuits and using electrical laws in solving problems and/or formal electrical analysis methods. C6.Employ the statistical, probabilistic and mathematical techniques in analyzing data and interpreting experimental results. **Through the following:** c1) Solve problems sheets related to the course material c2) Collect information from relevant sources and use it in
D- General and transferable Skills	**At the end of the course, the student will have:** D3. Work as a member of a development team, recognizing the different roles within a team and different ways of organizing teams. D6. Demonstrate skills in team work, team management, time management and organizational skills. **Through the following:**

	d1) Gradates would be able to cooperate in teams d2) Graduate would develop self-professional scientific and personal attitude towards continuous education d3) Graduate would be able to gain access to data and information from libraries and internet related to the course subject.

4-Course Content:	1. Basic logic concepts: Logic states, number systems, 2. Boolean algebra, basic logical operations, gates and truth tables. 3. Combinational logic: Minimization techniques, Multiplexers and de-Multiplexers, 4. encoders, decoders, adders and subtractors, look-ahead carry, 5. comparators, programmable logic arrays and memories, design with MSI, 6. logic families, tri-state devices, CMOS and TTL logic interfacing. 7. Sequential logic: Flip-flops, monostable multivibrators, 8. latches and registers, counters, shift registers. 9. Analog to digital conversion, digital-to-analog conversion, data acquisition, 10. microprocessors.

5- Teaching and Learning Methods:	▪ Lectures ▪ Tutorials ▪ Computer-lab Sessions ▪ Practical lab work ▪ Class discussions ▪ Internet searches ▪ Independent Work ▪ Group projects ▪ Problem-based Learning

6- Teaching and Learning Methods for handicapped students :	-

7- Student Assessment	
A- Assessment Methods:	1. Assignments and Quizzes 2. Midterm written exam 3. Oral Exam 4. Practical exam 5. Final written exam
B- Assessment schedule:	Midterm Examination: Week 7 or 8 Practical examination: Week 13 Oral Examination: Week 14 Final Examination: Week 15

C- Weighting of assessments:	Assignments and Quizzes	0 %
	Mid-Term Examination	16%
	Oral Examination	8%
	Practical Examination	16%
	Final-term Examination	60%
	100 %	**Total**

8- Books and References		
A- Notes:	-	
B- Essential Books (Text Books):	i.	Logic and Computer Design Fundamentals , 2 nd Edition , by M.M. Mano and C.R Kime published by Prentice Hall , 2007 .
C- Recommended Books:	▪ Digital Fundamentals, 11' Edition by Thomas L. Floyd, published by Prentice Hall, 2014.	
D- Periodicals, Web sites, … etc	http:// www.ee .usyd.edu.au/	

- **Course Coordinator:** Dr. Shereen Aly Taie

- Head of Department: Dr. Amira Edress Signature:……

Date: 12-10-2016

Course Content Intended Learning Outcomes Matrix

Course Title: Logic Design **Course Code:** CSC 261

Course Content	Week	Knowledge & Understanding				Intellectual Skills							Professional & Practical Skills		General & Transferable Skills		
		a1	a2	a3	a4	b1	b2	b3	b4	b5	b6	b7	c1	c2	d1	d2	d3
1. Basic logic concepts: Logic states, number systems,	1		x	x	x	x	x	x	x	x	x		x	x	x	x	x
2. Boolean algebra, basic logical operations, gates and truth tables.	2			x	x							x	x	x	x	x	x
3. Combinational logic: Minimization techniques, Multiplexers and de-Multiplexers,	3		x		x							x	x	x	x	x	x
4. encoders, decoders, adders and subtractors, look-ahead carry,	4			x		x						x	x	x	x	x	x
5. comparators, programmable logic arrays and memories, design with MSI,	5			x									x	x	x	x	x
6. logic families, tri-state devices, CMOS and TTL logic interfacing.	6	x											x	x	x	x	x
7. Sequential logic: Flip-flops, monostable multivibrators,	7:8			x									x	x	x	x	x
8. latches and registers, counters, shift registers.	9			x									x	x	x	x	x
9. Analog to digital conversion, digital-to-analog conversion, data acquisition,	10			x									x	x	x	x	x
10. microprocessors	11:12			x									x	x	x	x	x

Course coordinator: Dr. Shereen Aly Taie Head of Department: Dr. Amira edrees Date: