Logic Design Course Specifications

Faculty: Computer and Informatics

Department: Scientific Computing

Program(s) on which the course is given : Bachelor in Computers and informatics

Major or Minor element of programs : All majors

Department offering the program : Scientific Computing

Department offering the course : Computer System

Academic year / Level : 2nd Year / B.Sc.

Date of specification approval : 15/9/200**9**

A. Basic Information

Title: Logic Design   **Code:** CHW 261

Lecture: 3hrs/Week   **Practical:** 3hrs/Week   **Tutorial:** ---

Credit Hours: ---   **Total:** 6hrs/Week

B. Professional Information

1. **Overall Aims of Course:**

    This course introduces the student to the field of logic design .it is considered as the basic course in studying the computer hardware .the course may be divided into three parts. In the first part the student is introduced to numbering system , logic gates and simplification of Boolean expressions . In the second part, analysis and design of combinational circuits is explained along with some basic combinational circuits. In the third part, sequential circuits is introduced along with some famous counters and register circuits

2. Intended Learning Outcomes of Course (ILOs):

a. Knowledge and Understanding:

Students who complete the course will have the ability to:

a1- Understand different numbering systems and codes used to represent data in computers.

a2- Understand basic logical operations, gates and truth tables.

a3- Describe and state Boolean algebra.

a4- Define and describe Minimization techniques

a5- Multiplexers and de-Multiplexers, encoders, decoders, adders and subtractors, programmable logic arrays and memory modules (RAM and ROM), and error detection.

a6- Learn working with registers and shift registers.

a7- Understand the relationships between combinational and sequential circuits.

b. Intellectual Skills:

Students who complete the course will have the ability to:

b1- Analyze characteristics of different logic gates.

b2- Analyze and integrate of combinational circuits.

b3- Analyze and integrate sequential circuits.

b4- The ability to design building more advanced digital applications.

c. Professional and Practical Skills:

Knowledge of the concepts and material presented in this course will provide the students with practical know-how to:

c1- . Design combinational circuits.

c2- Design sequential circuits.

c3- Design memory advanced digital applications.

c4- Work effectively as an individual and as a member of a team.

c5- Give technical presentations.

d. General and Transferable Skills:

Knowledge of the concepts and material presented in this course will provide the students with the capability to:

d1- Give technical presentations.

d2- Work in stressful environment and within constraints .

d3- Use current technology in laboratories.

d4- To present students with applications of digital circuits to computer systems.

d5- Be capable of applying both traditional and new concepts and skills.

d6- Work within and contribute to a team, apply management .

d7- The ability to design and apply hardware solutions for computer work.

e. Attitude:

e1- How to make a collaborative work with other students especially in the e-learning environment.

e2- Learn how to make relation with other, and the limit of this relation.

e3- Discuss the legal background of copyright in national and international law.

3. Contents:

Topic	No. of hours	Lecture	Tutorial/Practical
Number systems	6	3	3

Digital codes	6	3	3
Logic gates	6	3	3
Boolean algebra	6	3	3
Simplification using Karnaugh maps	6	3	3
Digital combinational logic (decoders, encoders, multiplexers, demultiplexers)	6	3	3
Digital combinational logic (adders and subtractors)	6	3	3
Digital combinational logic (comparators, multipliers, dividers)	6	3	3
Sequential logic and flip flop (part I)	6	3	3
Sequential logic and flip flop (part 2)	6	3	3
Analysis of sequential circuits	6	3	3
Design of sequential circuits	6	3	3
Counter circuits	6	3	3
Registers	6	3	3