Menoufiya University
Faculty of Computers and Information
Department of Computer Science

جامعة المنوفية
كلية الحاسبات والمعلومات
قسم علوم الحاسب

COURSE SPECIFICATION

(LOGIC DESIGN-2)

Programme(s) on which the course is given	CS, IT, IS and OR
Major or Minor element of programs	Major
Department offering the program	Computer Science
Department offering the course	Computer Science
Academic year / Level	2nd Year / 1st Semester

A- Basic Information

Title	Logic Design-2			Code	CS222	
Credit Hours	Lecture	3	Tutorial	1	Practical	2
	Total				6	

B- Professional Information

1- Overall aims of course

- Understand the principles and operations of sequential circuits, starting from Flip flops till complete sequential circuits.
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2- Intended learning outcomes of course (ILOs)

2a- Knowledge and understanding

a5 Recognize and appreciate the professional and ethical responsibilities of the practicing computer professional including understanding the need for quality.

2b- Intellectual skills

b1 Solve a wide range of problems related to the analysis, design and construction of computer systems

b2 Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by society, organizations, and technology.

2c- Professional and practical skills

c6 Use appropriate computer-based design support tools

c8 Appreciate the features of complex computing hardware and software and operate them effectively

2d- General and transferable skills

d4 Strike the balance between self-reliance and seeking help when necessary in new situations.

d7 Demonstrate significantly enhanced group working abilities.

3- Contents

Topic	No of hours	Lecture	Tutorial /Practical
1 Introduction • Combinational and Sequential Circuits. • Synchronous and asynchronous Sequential Circuits. • State Diagram and State Variables.	3	3	-
2 Flip Flops • Introduction • The Bistable Element • The SR Flip-Flop • The Clocked SR Latch • The D-Type Latch • The JK Flip-Flop • Triggering the Flip-flops	15	9	6
3 Counters • Introduction • Asynchronous Ripple Counters • Arbitrary Count Asynchronous Counters • Synchronous Counters • Arbitrary Count Synchronous Counters • IC Synchronous Counters • Up/Down Synchronous Counters • Cascaded Counters • Counter Decoding • Counter Applications	12	6	6
4 Registers • Introduction • Shift Register • Bidirectional Shift Registers • The Universal Shifts Counters • The use of Shift Registers as Counters • Sequence Generators • The Ring Counter • The Johnson Counter • MLS Shift Registers	15	9	6

5 Synchronous Sequential Circuits • Introduction • Analysis Procedure • Design Examples • Design Procedure	15	9	6
6 Sequential Logic Programming • Introduction • The FPGA and sequential programming • Implementing counters and registers • Using the VHDL language to implement a general sequential circuit.		-	18
7 The Main Memory • Introduction • Read Only Memory • Programmable ROMs • ROM Applications • Read Write Memories • Dynamic RAMs • Memory Expansion	6	6	-
Total sum	**84**	**42**	**42**

4- Teaching and learning methods

4.1 Lectures.
4.2 Practical experiments in the laboratory.
4.3 Exercises and tutorials.
4.4 Research assignments.

5- Student assessment methods

5-a Methods

5.a.1 Reports, assignments, and exercises to assess knowledge and understanding.
5.a.2 Regular oral, practical and written quizzes to assess intellectual skills.
5.a.3 Practical projects, final practical and oral exams to assess professional skills.
5.a.4 Reports, assignments, and discussions to assess general and transferable skills.
5.a.5 Final written exam to assess knowledge and understanding.

5-b Assessment schedule

Assessment 1	5^{th} week.	Mid term exam
Assessment 2	8^{th} week.	
Assessment 3	10^{th} week.	
Assessment 4	16^{th} week (Oral and practical)	
Assessment 5	17^{th} -18^{th} weeks (final written exam)	

5-c Weighting of assessments

Semester work	10%
Mid-term examination	10%
Oral / Practical examination.	20%
Final-term examination	60%
Total	100%

6- List of references

6-a Course notes

There are lectures notes prepared in the form of a book authorized by the department

6-b Essential books (text books)

[1] R. Tocci, Digital Systems Principles and Applications, six editions, 1991, Prentice-Hall, Inc.

6-c Recommended books

[1] B. Holdsworth, Digital Logic Design, Third edition, 1993, Butterworth-Heinemann Ltd.

[2] R. Tocci, Digital Circuits, Prentice-Hall Inc., 2001.

[3] A book prepared and edited by the lecturer, and approved by the department council.

6-d Periodicals, Web sites, … etc

IEEE transactions on computers and software.

7- Facilities required for teaching and learning

- Digital Design and logic programming laboratories.
- Laboratory equipments, apparatus and kits.
- Datashow, screen, and laptop computer.

Course coordinator:

Prof. Fawzy Ali Torkey

Head of Department:

Prof. Nabil Abd-El-Wahid Ismail

Date: / /