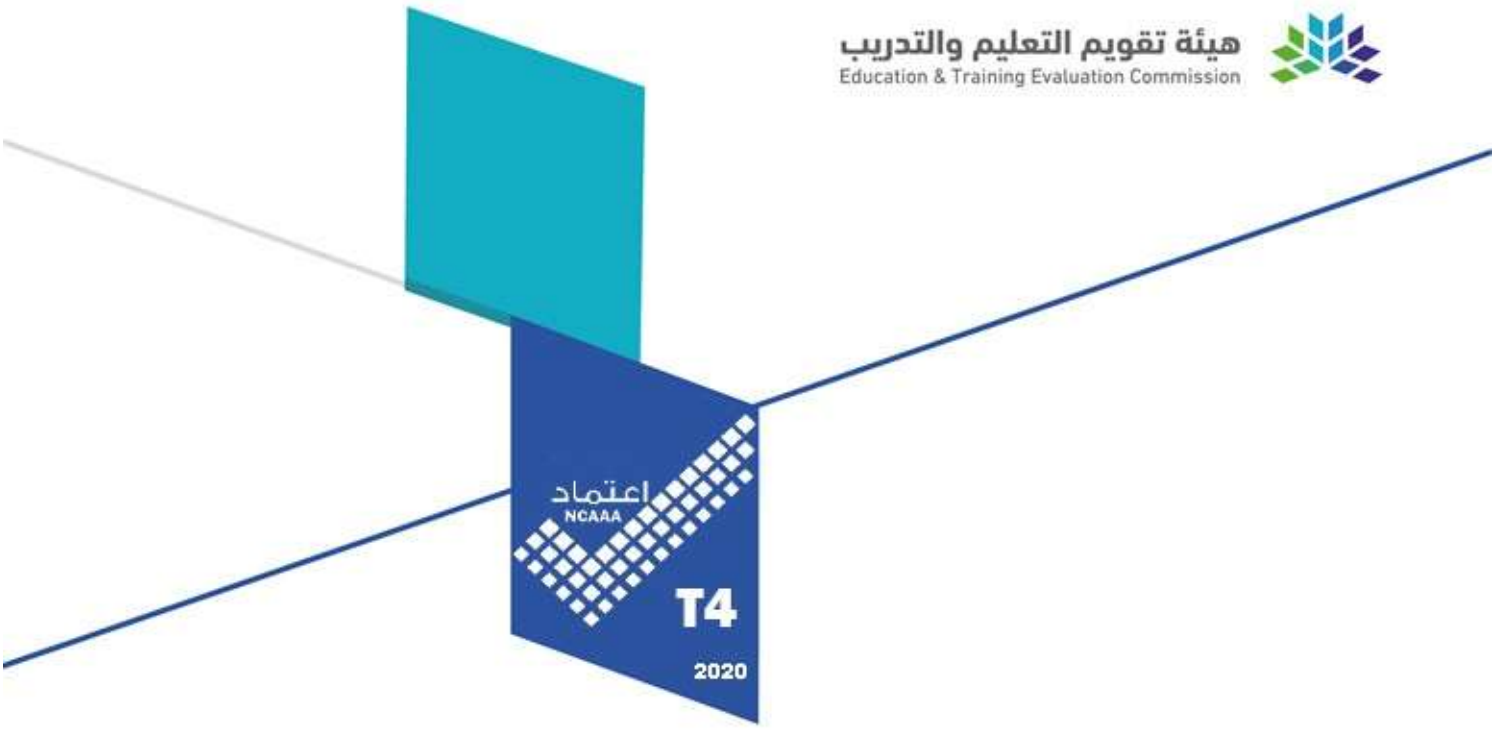
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Digital Logic Design
Course Code:	**CEN2130**
Program:	**Computer and Network engineering**
Department:	**Computer Engineering Department**
College:	**College of computers and information systems**
Institution:	**Umm Al-Qura University**

Table of Contents

A. Course Identification

1. Credit hours: 4
2. Course type **a.** University [ ] College [ ] Department [√] Others [ ] **b.** Required [√] Elective [ ]
3. Level/year at which this course is offered: Level 4/ Year 2
4. Pre-requisites for this course (if any)**:**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	60	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	
4	**Others** (specify)	
	Total	

B. Course Objectives and Learning Outcomes

1. Course Description

Introduction to information representation and number systems. Boolean algebra and switching theory. Manipulation and minimization of completely and incompletely specified Boolean functions. Propagation delay, timing diagrams. Combinational circuits design using multiplexers, decoders, comparators and adders. Sequential circuit analysis and design, basic flip-flops, clocking and timing diagrams.

2. Course Main Objective

This course covers the following items:

- Number Systems.
- Binary arithmetic.
- Boolean/Logic functions.

- Boolean Algebra.
- logic gates.
- function minimization.
- analysis and synthesis of combinational and sequential circuits.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	After the completion of the course, students will know the number systems, Boolean algebra, and simplification techniques for digital logic circuits.	K1
1.2	Student will be able to apply the knowledge obtained in steps 1 in design of combinational and sequential circuits	K2
2	**Skills :**	
2.1	Ability to solve problems related to digital systems	S1
2.2	Ability of deduction and inference.	S3
2.3	Ability of analysis and design of different digital circuits	S2
3	**Values:**	
3.1	Be an independent learner, able to acquire further knowledge with some guidance or support.	V1
3.2	Manage time and meet deadlines	V1

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to digital design	2
2	Number Systems and Codes	4
3	Logic Gates	6
4	Boolean Algebra and Logic Simplification	12
5	Combinational Logic Analysis	12
6	Functions of Combinational Logic	12
7	Sequential logic: design and analysis	12
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.1	After the completion of the course, students will know the number systems, Boolean algebra, and simplification techniques for digital logic circuits.	• Lectures • Lab	• Examinations • homework
1.2	Student will be able to apply the knowledge obtained in steps 1 in design of combinational and sequential circuits		
2.0	**Skills**		
2.1	Ability to solve problems related to digital systems.	• Lectures • Lab	• Examinations • homework
2.2	Ability of deduction and inference.		
2.3	Ability of analysis and design of different digital circuits		
3.0	**Values**		
3.1	Be an independent learner, able to acquire further knowledge with some guidance or support.	• Lectures • Lab	• Examinations • homework
3.2	Manage time and meet deadlines		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Lab evaluation	Throughout semester	25%
2	Quiz	4,8	10%
3	Mid Term	5,10	20%
4	Homework	Throughout semester	5%
5	Final Exam	12	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

Faculty is available 10 hours per week for student help and consulting

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	M. Morris Mano and Michael Ciletti, Digital Design, Prentice Hall
Essential References Materials	
Electronic Materials	http://uqu.edu.sa/azabid http://www.asic-world.com/digital
Other Learning Materials	Modelsim for simulation of Verilog examples.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	1. A Lecture room having Multimedia projector for lectures and students' presentation. 2. Digital Logic Design Lab.
Technology Resources (AV, data show, Smart Board, software, etc.)	1. There are computer labs available for development of software skills. 2. Students are encouraged to bring in their laptops and use them in solving problems in the classroom.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Students	Course Survey and students Feedback for each learning outcome of the course.
Evaluation of Teaching	Instructor	• Faculty meetings to discuss best practices and issues related to the course • Comparison of the course content with

Evaluation Areas/Issues	Evaluators	Evaluation Methods
		similar courses offered in others colleges • Updating course curriculum according to latest research done in the field.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	