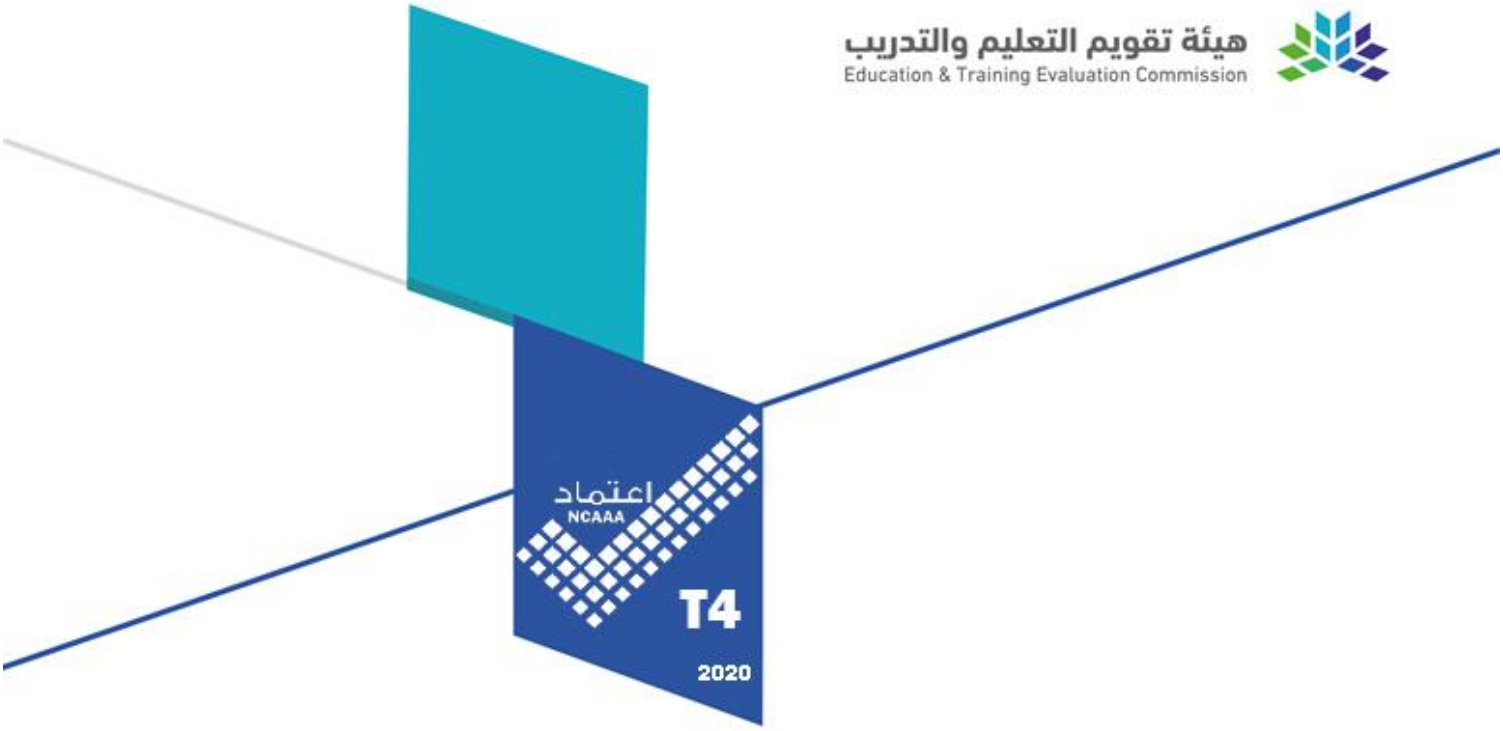
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Digital Logic Design
Course Code:	503221-4
Program:	**Bachelor in Computer Science**
Department:	**Department of Computer Engineering**
College:	**College of Computers and Information Technology**
Institution:	**Taif 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: 6/2
4. Pre-requisites for this course (if any)**:** Discrete Structure (501215-3)
5. Co-requisites for this course (if any)**: NON**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	8	100%
2	**Blended**	0	0
3	**E-learning**	0	0
4	**Distance learning**	0	0
5	**Other**	0	0

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	50
2	**Laboratory/Studio**	30
3	**Tutorial**	0
4	**Others** (specify)	0
	Total	80

B. Course Objectives and Learning Outcomes

1. Course Description

This course covers many basic topics such as numbering systems, Boolean algebra, simplification using Boolean algebra and Karnaugh maps, and different logic gates. The course also deals with analysis and synthesis of combinational circuits, e.g., adders, encoders, decoders, multiplexers and demultiplexers. Flip-flops and Sequential circuits such as registers, counters, and other basic also presented. The course prepares the students to apply the above basic skills to design, implement, and test digital logic circuits in the laboratory.

2. Course Main Objective

This course prepares student to deal with logic circuits and give them the skills to design and implement both combinational and sequential circuits

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	

CLOs		Aligned PLOs
2	**Skills :**	
2.1	Represent numbers using different number systems, and to perform basic binary operations.	S2
2.2	Apply the different switching algebra theorems for the minimization of logic functions.	S2
2.3	Apply Karnaugh map for minimization of logic functions.	S2
2.4	Analyze and design different combinational circuits.	S1
2.5	Analyze and design different sequential circuits.	S1
3	**Values:**	

C. Course Content

No	List of Topics	Contact Hours
1	Introductory Digital Concepts	4
2	Number systems, Binary addition, subtraction, Representation of negative numbers, 2's complement addition/subtraction, Binary codes.	4
3	Switching algebra, Theorems, Standard representation of logic functions	8
4	Truth table, Minimization techniques.	8
5	Simplification of three and four variable using Karnaugh maps and Don't care.	4
6	Combinational circuits building blocks Half and Full adders, Encoders/Decoders. Mux/Dmux/XOR circuits.	8
7	Programmable Logic Devices. Design examples with MSI. ALU and PLD circuits	8
8	Sequential Circuits. Bistable elements. Latches and Flip Flops. Flip Flops and Related Devices	8
9	Theoretical design Shift registers serial and parallel	8
10	Design examples of Shift registers serial and parallel	8
11	Finite State machine; design analysis and synthesis.	8
12	Counters serial and parallel, Design examples.	4
Total		80

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**		
2.0	**Skills**		
2.1	Represent numbers using different number systems, and to perform basic binary operations.	Lecture Discussion Problem Solving Mini project	Written Exams Quizzes Assignments Practical Test

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.2	Apply the different switching algebra theorems for the minimization of logic functions.	Lecture Discussion Problem Solving Mini project	Written Exams Quizzes Assignments Practical Test
2.3	Apply Karnaugh map for minimization of logic functions.	Lecture Discussion Problem Solving Mini project	Written Exams Quizzes Assignments Practical Test
2.4	Analyze and design different combinational circuits.	Lecture Discussion Problem Solving Mini project	Written Exams Quizzes Assignments Practical Test
2.5	Analyze and design different sequential circuits.	Lecture Discussion Problem Solving Mini project	Written Exams Quizzes Assignments Practical Test
3.0	**Values**		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments	3,5,6,9,10	10%
2	Midterm Exam	6	20%
3	Lab Exam	10	20%
4	Final Exam	12	50%

***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 :

Academic advising and counseling of students is an important component of teaching; student academic advising is a mandatory requirement of College of Computers and Information Technology (CCIT). Appropriate student advising provides support needed for the student during times of difficulty. In addition, it helps the student to build a close relationship with his/her advisor and to provide student motivation and involvement with the institution.

In addition, since faculty are usually the first to recognize that a student is having difficulty, faculty members play a key role in developing solutions for the students or referring them to appropriate services. Faculty members also participate in the formal student-mentoring program.

Additional counseling is provided by course directors, who provide students with academic reinforcement and assistance and refer “at risk” students to the Vice Dean for Academic Affairs and the Vice Dean for female section.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	M. Mano, "Digital Design", third edition, Prentice Hall, 2002.
Essential References Materials	T. L. Floyd, "Fundamentals of Digital Design", 6 th edition, Prentice-Hall, 2006.
Electronic Materials	NON
Other Learning Materials	NON

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• A Lecture room appropriate for maximum 25 students with a personal computer, a data show and a smart board. • A Lab room appropriate for maximum 15 students with a personal computer, a data show and a smart board.
Technology Resources (AV, data show, Smart Board, software, etc.)	• Lab materials and required software
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	Students' surveys and Student's course evaluation
Improvement of Teaching	Course Coordinator	deficiencies based on the student Evaluation, faculty input, course file, and program assessment
Verifying Standards of Student Achievement	Curriculum Committee	• Review CAF (Course assessment file) • Alumni surveys. Periodic exchange and remarking of tests or a sample of assignments with staff at another

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	CS council
Reference No.	Meeting #12
Date	23-10-1443