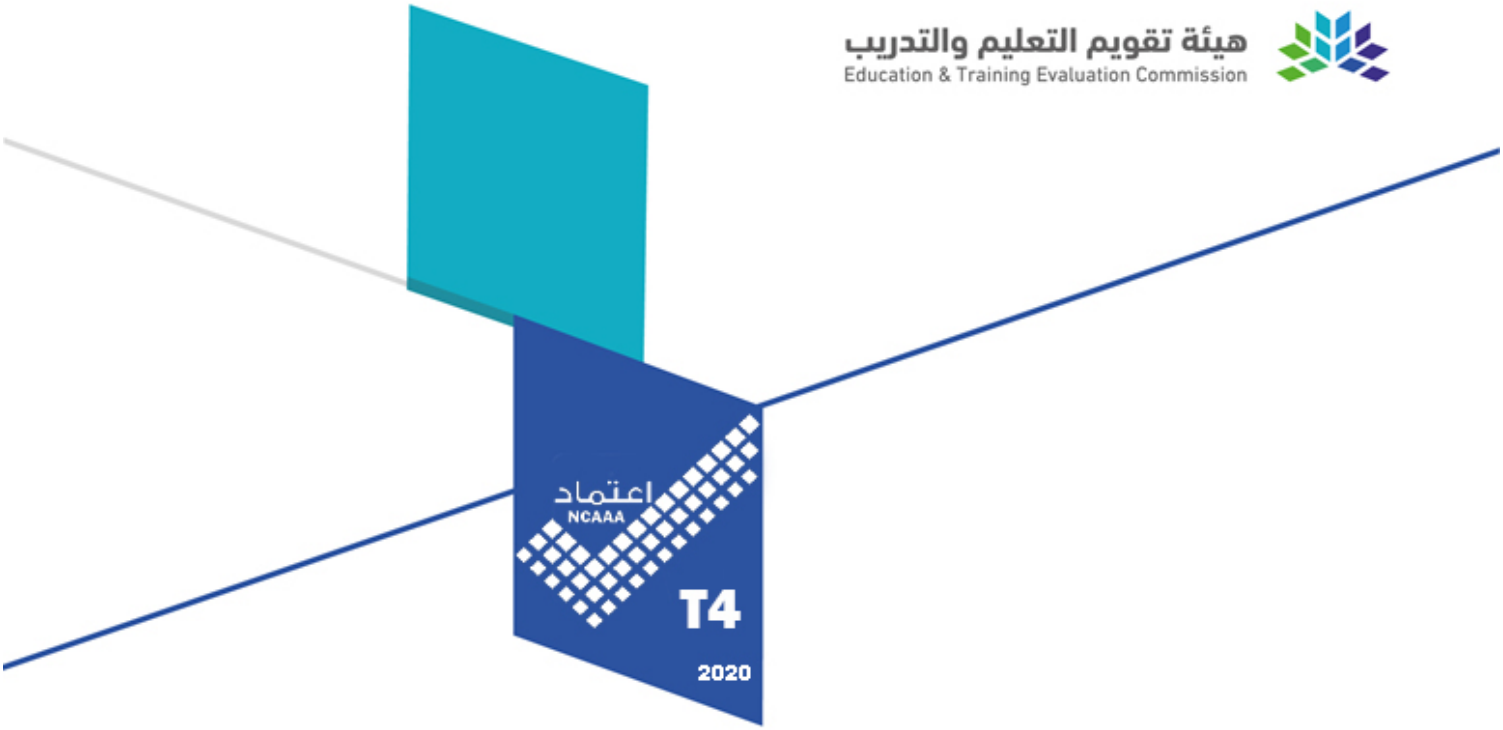
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	**Digital Logic Concepts**
Course Code:	**LOGC 1202**
Program:	**Computer Science**
Department:	**Computer Science**
College:	**Hekma School of Engineering, Computing, and Informatics**
Institution:	**Dar Al-Hekma University**

Table of Contents

A. Course Identification

1. Credit hours: 2 (1,2)
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: 1st year, 1st semester
4. Pre-requisites for this course (if any)**:** None
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**	36	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	16
2	**Laboratory/Studio**	20
3	**Tutorial**	
4	**Others** (specify)	
	Total	36

B. Course Objectives and Learning Outcomes

1. Course Description

This course focuses on fundamental constructs and concepts underlying computer hardware, the structure of computers components, and digital logic. It presents number systems notions and operations including decimal, binary, octal, and hexadecimal systems. The course also covers binary arithmetic, codes, Boolean algebra, gates, Boolean expressions, sequential circuits, and flip/flops.

2. Course Main Objective

This course aims to learn the fundamental constructs and concepts underlying computer hardware, the structure of computers components, and digital logic. It presents number systems notions and operations including decimal, binary, octal, and hexadecimal systems. The course also covers binary arithmetic, codes, Boolean algebra, gates, Boolean expressions, sequential circuits, and flip/flops.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	**Convert between different number systems (decimal, binary, hexadecimal, and octal).**	1
1.2	**Perform binary arithmetic operations including addition, subtraction and multiplication.**	1
1.3	Identify Boolean Algebra Gates and Truth Tables.	1
1.4	**Differentiate between the combinational logic and sequential circuits**	1
2	**Skills :**	
2.1	**Express logic circuit graphs using Boolean expressions and vice versa.**	2
2.2	**Simplify Boolean Expression Using Karnaugh Map.**	2
2.3	Create a logical block using the logical gate kit in the laboratory	2
2.4	Design sequential circuits.	2
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Digital Concepts	2
2	Number Systems Notations	6
3	Binary Arithmetic Operations	4
4	Logic gates	4
5	Boolean Algebra and logic Simplification	4
6	Karnaugh maps and Gate Level Minimization	4
7	Combinational Logic Design	6
8	Sequential Logic Design	6
Total		36

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**		
1.1	**Convert between different number systems (decimal, binary, hexadecimal, and octal).**	• Lectures • Labs	• Quizzes • Assignments • Exams
1.2	**Perform binary arithmetic operations including addition, subtraction and multiplication.**	• Lectures • Labs	• Quizzes • Assignments • Exams

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.3	Identify Boolean Algebra Gates and Truth Tables.	• Lectures • Labs	• Quizzes • Assignments • Exams
1.4	**Differentiate between the combinational logic and sequential circuits**	• Lectures • Labs	• Quizzes • Assignments • Exams
2.0	**Skills**		
2.1	**Express logic circuit graphs using Boolean expressions and vice versa.**	• Lectures • Labs	• Quizzes • Assignments • Exams
2.2	**Simplify Boolean Expression Using Karnaugh Map.**	• Lectures • Labs	• Quizzes • Assignments • Exams
2.3	Create a logical block using the logical gate kit in the laboratory	• Lectures • Labs	• Quizzes • Assignments • Exams
2.4	Design sequential circuits.	• Lectures • Labs	• Quizzes • Assignments • Exams
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	6th	10%
2	Assignment 1	8th	10%
3	Midterm	9th	20%
4	Quiz 2	13th	10%
5	Assignment 2	14th	10%
6	Final	16th	30%
7	Participation		10%

***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 :

Full time faculty are required to have a minimum of 10 office hours per week on campus. Usually, the time allotted to student exceeds this amount since faculty are always available to students as required.

Part time faculty are required to have a minimum of one office hour per week on campus for each course. The faculty is also available through email and Blackboard messaging system.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Floyd, T. L. (2015). Digital fundamentals. 11th edition. USA: Pearson. ISBN: 9780132737968
Essential References Materials	M Morris R. Mano. (2015). *Logic and Computer Design Fundamentals. 5th edition*. Pearson. ISBN-13: 9780134080154
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms, and Laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	
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
Course Indirect Assessment (ABET): the instructor collects valuable feedback regarding the course CLOs	Students	Course Survey, indirect
Student course evaluations: The university collects valuable feedback from the student course evaluation which is completed at the end of the semester for each course.	Students	University Survey, indirect
Other surveys: The University gathers several surveys measuring teaching effectiveness; this includes Student Satisfaction Survey and Graduating Senior Survey which are both held every year.	Students	Questionnaire, indirect
Peer & department chair visits and evaluations	Faculty members	Visits & evaluation form, indirect
Performance management KPIs annual assessment	Quality Assurance Office	Forms, direct
Course reports	Faculty Members	Forms, direct
Annual program reports	Program Director	Forms, direct

Evaluation Areas/Issues	Evaluators	Evaluation Methods
External evaluation for course reports and files once a year	External examiner	Forms, indirect

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	6
Reference No.	6
Date	20/05/2021