King Saud University

College of Computer and Information Sciences

Department of Computer Engineering

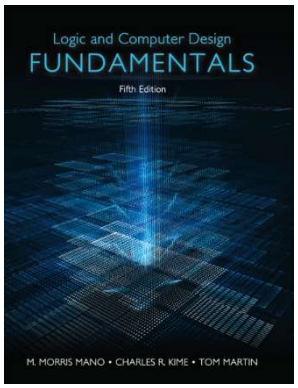
1. Course number and name: **CEN 211, Digital Logic design 1**

2. Credits and contact hours: **4 (3, 0, 1)**

3. Instructor's or course coordinator's name: Haikel Hichri

4. Text book, title, author, and year:

Logic and Computer Design Fundamentals, M. Morris Mano & Charles R. Kime, 5th Ed. 2015, Pearson Education.



Tutorial book and Lab book are available in the college print shop.

Course website: https://sites.google.com/site/drhichri/teaching/cenn211

5. Specific course information

a. Course description (catalog)

This course provides students with basic knowledge on combinational and sequential circuit design. The course includes a lab component to help students get hands-on experience with the theoretical concepts they take in the course

b. prerequisites or co-requisites: MATH 151 (prerequisite).

c. Required, elective, or selected elective course: Required.

6. Specific goals for the course

a. Course Learning Outcomes: This course requires the student to demonstrate the following

1. Apply number systems including base conversion and arithmetic operations
2. Simplify Boolean expressions using Boolean algebra rules and k-maps
3. Discuss the physical properties of logic gates such as fan-in, fan-out, logic voltages and noise margins.
4. Analyze and design combinational logic circuits and building blocks
5. Analyze sequential circuits and basic memory elements
6. Design basic state diagrams including Mealy and Moore types
7. Build, test, and troubleshoot a digital electronic circuit

b. Contribution of Course to Meeting Curriculum Disciplines:

Curriculum Discipline	Percentage
Mathematics and Basic Science	20
Engineering Science	
Engineering Design	80
General Education	

c. Relationship of Course to Student Outcomes

Outcome	Student Outcome Description	Contribution
(a)	an ability to apply knowledge of mathematics, science, and engineering	√
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	√
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	√
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

8. Assessment Plan for the Course

Test 1	15%
Test 2	15%
HW/Quiz	5%
Lab work	25%
Final Exam	40%
TOTAL	**100%**

9. Course Policies

- All exams are closed book.
- The final exam will be comprehensive.
- **All students who have an absence rate of more than 25% will be barred from taking the final exam.**

11 . Brief list of topics to be covered and schedule in weeks

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Discuss the physical properties of logic gates such as fan-in, fan-out, logic voltages and noise margins.	**1**	**8**
Describe the design of basic memory elements such as SR latch and D flip-flop.	**1**	**4**
Simplify Boolean expressions by applying appropriate laws and using k-maps.	**1**	**4**
Design combinational building blocks such as decoders and multiplexers	**1**	**4**
Analyze sequential circuits	**3**	**8**
Design basic state diagrams including Mealy and Moore types	**1**	**4**
Build, test, and troubleshoot a digital electronic circuit	**2**	8

10. Contact details

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For office hours check my website: http://fac.ksu.edu.sa/hhichri/
Course website: https://sites.google.com/site/drhichri/teaching/cenn211