



**MUTAH UNIVERSITY**  
**Faculty of Engineering Department of**  
**Electrical Engineering**



**Course Syllabus**

Course Code	Course Name	Credits	Contact Hours
0401363	Digital Electronics	3	3 T

**INSTRUCTOR/COORDINATOR**

<b>Name</b>	Dr. Omar Al-Ayasrah
<b>Email/Office</b>	o_alayasrah@mutah.edu.jo / Eng. Bldg.-Vice Dean Office
<b>Office Hours</b>	12:00-13:00 (Sun, Tues)
<b>Classroom/Time</b>	Eng. 8 / 11:00 – 12:00 (Sun., Tues.), (Thurs.-Online)

**TEXTBOOK**

<b>Title</b>	Principles of Electronic Circuits
<b>Author/Year/Edition</b>	S. G. Burns and P. R. Bond, West Publishing Co

**Other Supplemental Materials**

<b>Title</b>	Digital Integrated Circuits
<b>Author/Year/Edition</b>	T. DeMassa and Z. Cicconi, John Wiley and Sons Inc.
<b>Title</b>	Microelectronic Circuits
<b>Author/Year/Edition</b>	Adel S.Sedra,Kenneth C.Smith./2015/ 7th Edition

**SPECIFIC COURSE INFORMATION**

**A. Brief Description of the Content of the Course (Catalog Description)**

Diodes and transistors as switches. Noise margin, Switching time, Fan-out, speed limitations, and Voltage transfer characteristics (VTC). RTL, DTL, TTL, ECL, MOS, CMOS/Bi-MOS logic gates. Interfacing and expansion of logic circuits. Comparators, A/D and D/A converters. Sample and hold circuits. ALU, Memories and memory mapping. Schmitt triggers. Multivibrators. Timing circuits.

**B. Pre-requisites (P) or Co-requisites (C)**

Electronics (2) (0401362) (P)

**C. Course Type (Required or Elective)**

Required

## SPECIFIC GOALS

### A. Course Learning Objectives (CLOs)

By the end of this course, the student should be able to:

**CLO 1:** apply electronic circuits in different logic gates [1].

**CLO 2:** analyze DTL,TTL,MOS ,and CMOS logic gates [1].

**CLO 3:** analyze and design symmetric CMOS gates, multivibrators circuit [2].

**CLO 4:** analyze and design the A/D and D/A converters and TDM systems [2].

### B. Student Learning Outcomes (SLOs) Addressed by the Course

1	2	3	4	5	6	7
✓	✓					

## BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Introduction to diodes, BJT and MOSFET as a switch for digital circuits.	1	3
Analyze and Design RTL,DTL,and TTL logic families . Understand :Noise margin, ,propagation delay, Switching time ,speed limitations, fan- out and voltage transfer characteristics VTC .	3	9
PMOS, NMOS and CMOS logic gates, analysis and design.	2	6
Interfacing and expansion of logic circuits.	1	3
Analysis and design the multivibrator circuit :Bistable, monostable and astable .	2	6
Comparator and Schmitt Trigger circuit : analysis and some applications	2	6
555 Timer and some applications in the timing circuits application.	1	3
Analog to digital A/D and digital to analog D/A converters	2	6
<i>Total</i>	<i>14</i>	<i>42</i>

## EVALUATION

Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	30
Course Work (Homeworks, Quizzes, Projects ...etc.)	One week after being assigned	20
Final Exam	According to the university calendar	50

### ABET's Students Learning Outcomes (Criterion # 3)

Relationship to program outcomes	
<b>ABET 1-7</b>	<b>Engineering Student Outcomes</b>
1	√ an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	√ an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3	an ability to communicate effectively with a range of audiences.
4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.