**Zarqa University**

**Faculty of Engineering**
**Department: Electrical Engineering**
**Course title: Digital Fundamentals (0904234)**

**Course description:**

Logic levels and pulse waveforms; number systems and their conversion; types of logic gates; Boolean algebra; combinational logic; types of sequential elements and their applications; memories: types and classifications.

**Aims of the course:**

1. . Students will learn the number representations used in today's digital systems and their arithmetic properties and conversion techniques.
2. Students will learn to analyze and synthesize networks of combinatorial, digital logic elements.
3. Students will learn to analyze and design digital, clocked sequential circuits.
4. Students will enhance professional writing and participate in a teamwork process by performing engineering design using modern computer tools and writing a corresponding technical report.

**Intended Learning Outcomes (ILOs):**
At completing this module the student should be able to :
1. An ability to understand the basic different between digital and analog quantities and systems.
2. An ability to define different number systems and apply arithmetic operations to binary numbers.
3. An ability to understand the different switching algebra theorems and apply them for logic functions.
4. An ability to define the Karnaugh map for a few variables and perform an algorithmic reduction of logic functions.
5. An ability to define different combinational circuits.
6. An ability to understand the bi stable element and the different latches and flip-flops.
7. An ability to understand sequential circuits, like counters, shift registers, and so on.
8.An ability to list basic semiconductors memory types,  and explain the difference between RAM and ROM..

**Course structures:**

| Week | C. Hrs | ILOs | Topics | Teaching Procedure | Assessment methods |
|------|--------|------|--------|-------------------|--------------------|
| Week1 | | 1 | **Syllabus, Course Schedule;** **Chapter 1:** Logic levels and pulse waveforms | Lectures Notes | |
| Week 2-5 | | 2 | **Chapter** 2: number systems and their conversion | Lectures Notes | HW |
| Week 6 | | 3 | **Chapter** 3:types of logic gates | Lectures Notes | HW |
| Week 7-9 | | 4 | **Chapter** 4:Boolean Algebra and logic simplification | Lectures Notes | HW& Quizzes 1st Exam 2/4/2017 |
| Week 10-12 | | 5 | **Chapter** 5:combinational logic | Lectures Notes | HW& Quizzes 2nd Exam 7/5/2017 |
| Week 13-15 | | 6,7 | **Chapter** 6:types of sequential elements and their application | Lectures Notes | |
| Week 16 | | 8 | **Chapter** 7:memories: types and classification | Lectures Notes | HWs Final Exam (TBD) |

**References:**
Thomas Floyd, Digital Fundamentals, 10th edition, Pearson Education 2009

**Assessment Methods:**

| Methods | Grade | Date |
|---------|-------|------|
| Quizzes | 6 | 1+2 |
| HWs | 4 | Weekly |
| First Exame | 20 | 2/4/2017 |
| Second Exame | 20 | 7/2/2017 |
| Final Exame | 50 | TBD |