Digital Logic Design

- **Course number and name:**
  CC 216 – Digital Logic Design

- **Credits and contact hours**
  Credits Hours: 3Hrs
  Contact Hours: In Lecture 2Hrs, In Tutorial 2Hrs, and In Lab 2Hrs

- **Instructor's or course coordinator's name**
  Coordinator Name: Prof. Dr. Gamal Selim

- **Text book, title, author, and year**
  - Thomas L. Floyd, Digital Fundamentals, 9th Edition, Prentice Hall, 2006.

- **Specific course information**
  - **a. Catalog description**
    Number systems, binary arithmetic and codes, logic gates, Boolean algebra and logic simplifications, Design and realization of combinational circuits, Functions of combinational circuits logic: Flip-Flops, analysis design and realization of counters, analysis and realization of shift registers, Computer – aided engineering.
  - **b. prerequisites or co-requisites**
    Prerequisites: CC111
  - **c. Type of the course (required, elective, or selected elective course) in the program**
    Required Course

- **Specific goals for the course**
  - **a. Specific outcomes of instruction**
    After the completion of this course the students will be able to:

	Course Learning Outcomes	SO
1	Know the basic differences between analog and digital systems	A,J
2	Use binary numbers and codes	A,E
3	Describe the operation of logic gates	B,C
4	Apply Boolean algebra	B,C
5	Use Karnaugh maps for Logic Simplification	B,C,E
6	Find minimum terms using Tabular method ((Quine McCluskey)	B,C,D,E
7	Design combinational and sequential logic circuits	B,C,E,K
8	Use Flip Flops and related devices	B,C,E,K
9	Design synchronous & asynchronous counters	B,C,E,K
10	Design universal shift registers	B,C,E,K

Topics to be covered

- Introduction to Digital and Analog Systems, Number Systems,
- Logic Gates (AND, OR, INVERTER, NOR, NAND, XOR, XNOR)
- IC Technology and Overview on Programmable Logic (PAL, PLA, GAL)
- POS, SOP, Boolean Algebra and Logic Simplification
- Logic Simplification using Karnaugh Map (K-map)
- Tabular method (Quine McCluskey)
- Universal property of NAND and NOR Gates, Logic circuit operation with pulse waveforms.
- Introduction to Combinational Logic Circuits
- Full-Adder, Half-Adder, Look Ahead Carry Adder
- SUBTRACTOR, COMPARATOR, DECODER/ENCODER
- MULTIPLEXER/DEMULTIPLEXER (MUX/DEMUX)
- Flip-Flops and Related Devices
- Counter Design, Synchronous / Asynchronous Counters/ Up-Down Counters
- Shift Registers