

Digital System Design

- **Course number and name:**
CC 317 – Digital System Design

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

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

- **Text book, title, author, and year**
 - John F. Wakerly, “Digital design principles and practices”, Third Ed., Prentice Hall, 2001

- **Specific course information**
 - a. **Catalog description**
Introduction to digital design, combinational digital design and realization using: decoders, encoders, buffer, multiplexers, comparators, adders, and ALU, sequential design and realization using: latches, flip-flops, counters, and shift registers, memories, CPLD, and FPGA. Synchronous analysis and design using algorithmic state machines ASM, Digital design practice, CAD, using FPGA and CPLD.
 - b. **prerequisites or co-requisites**
Prerequisites: CC216
 - 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	Understand the concepts of digital systems design.	C
2	Understand combinational design & realization using ICs, Memories and programmable devices.	C
3	Use synchronous analysis, design and realization using algorithmic state machine ASM.	B,C
4	Use FPGA, CPLD based design techniques using VHDL or other HDL.	B,C
5	Design digital practical Applications.	B,C,D

Topics to be covered

- Introduction to digital design: Codes, Standard Representation of logic Functions
- Introduction to digital design, Quine-McCluskey
- Algorithmic state machine chart (ASM Chart), Propagation delay, Clock Skew, Timing Hazards
- Combinational logic design practices: VHDL
- Combinational logic design practices, CPLD, PLA, PLD, GAL, Combinational logic Design practices continued
- Sequential logic design practices
- Memories and programmable devices, applications with VHDL-based design using FPGA, CPLD
- Combinational logic design practices
- Additional Real-life system design