CS 303 - Logic and Digital System Design
Spring 2020-2021

Instructor: Ayhan Bozkurt, Room: FENS-1047, ext. 9537, e-mail: abozkurt@sabanciuniv.edu

Catalog Data: Number systems and conversion, Boolean algebra, the assertion level concept; minterm and maxterm expansions, Karnaugh maps, and Quine McCluskey minimization, combinatorial logic circuit design, NAND and NOR gate based design. State machines and sequential circuits flip-flops, minimization of state tables, state assignment. Higher-level digital system design using SSI-MSI blocks such multiplexers/decoders, adders, memory and programmable gate arrays; bus oriented systems. Asynchronous sequential circuits, flow tables, timing hazards.

Textbook:
- M. Morris Mano and Michael D. Ciletti. Digital Design, 5e/6e, Pearson.

Computer Usage: Logic Circuit Simulators / FPGA Development Tools

Goals: To develop the engineering skills of the students to analyze and design digital systems.

Course Outline:
- Number Systems & Arithmetic
- Boolean Algebra & Logic Operations
- Gate-Level Minimization
- Analysis & Design of Combinational Logic Circuits
- Analysis & Design of Synchronous Sequential Logic Circuits
- Registers & Counters
- Design with Algorithmic State Machines (ASM)
- Memory & Design with Programmable Logic

General Rules
- Homework and lab assignments are announced one week before the deadline.
- Submission deadlines are <u>never</u> postponed.
- Weekly quizzes starting from 2nd week. 12 quizzes in total.
- All quizzes counted in grade calculation. Make-ups for up to 3 quizzes (with legal excuse.)

Grading: Quizzes 50%; Lab assignments & Project 30%; HWs 5%; Final 15%.