CS 303 - Logic and Digital System Design
Fall 2020

This is a 4-credit, introductory course on logic and digital system design.

**Catalogue 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.

**Prerequisite / Co-requisite:** The class is open to undergraduate students / CS 303R and CS303L

**Instructor:** Erdinç Öztürk, FENS 1089, erdinco@sabanciuniv.edu

Office Hours: TBD

**Schedule:**
- Tuesday: 13:40 – 15:30
- Wednesday: 11:40 – 12:30


**Tentative 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
- Memory & Design with Programmable Logic
- Design with Algorithmic State Machines (ASM)

**Student Responsibilities (tentative)**

**Lab & Homework assignments:** There will be a minimum number of four laboratory and homework assignments. You will be required to use Foundation tools for schematic design and FPGA as the target device for your designs.
**CS 303 class projects:** In addition to lab and homework assignments, the students are required to work on a big development project. It is essential for students to meet the time schedule of the projects. Each student must provide a demonstration of their work.

Students will work alone for lab assignments and class projects.

**Grading**

- Midterm exams: 35% (15% + 20%)
- Final exam: 35%
- Short Homework: 5%
- Lab Assignments: 15%
- Project: 10%