CS 303 - Logic and Digital System Design - Fall 2021

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:
  Monday : 10:40 - 11:30 FMAN 1099
  Wednesday : 17:40 - 19:30 FENS G077

Teaching Assistants:
Ali Şah Özcan
Berke Ayrancıoğlu
Can Ayduman
Cengizhan Kana
Enes Recep Türkoğlu
Kemal Derya
Umut Barut
Uğur Berk Çelik
Waqar Ahmad
Şerafettin Serhan Özboz

Textbook: M. Morris Mano and Michael D. Ciletti. Digital Design: With an Introduction to the Verilog HDL. Fifth Edition, Pearson, 2013, ISBN 978-0-273-76452-6. (Any edition is fine)

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

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.

Tentative Grading:
- Midterm exams : 30% (15% + 15%)
- Final exam : 35%
- Short Homework : 5%
- Lab Assignments : 15%
- Term Project : 10%
- Quizzes : 5%

Grading Policy:
- Students are encouraged to study in groups for lab assignments and projects and homeworks. However, It is mandatory for each student to submit their original work.
- If a student does not submit their original work for any homework assignment, they will receive 0 points from the entire *Short Homework* item (5%).
- If a student does not submit their original work for any lab assignments, they will receive 0 points from the entire *Lab Assignments* item (15%).
- If a student does not submit their original work for the term project, they will receive 0 points from the entire *Term Project* item (10%).
- All lab assignments are mandatory. Failure to submit one lab assignment will result in a letter grade down. Failure to submit two lab assignments will result in an F grade. An unsuccessful submission will be determined by the TAs and the instructor. Receiving 0 points from any lab assignment will be considered an unsuccessful attempt. In this case you will be given an extra week as a second chance to submit your work, with a 50% reduced grade. You will not be given a third chance.

Make-up Exam:
There will be a single make-up exam, after the final exam. It is the responsibility of the student to contact the instructor if they need to take the make-up exam. The instructor will determine if the student is eligible for the make-up exam.