

EE302 DIGITAL INTEGRATED CIRCUITS

Spring 2021-2022

Instructor: Melik YAZICI	Time: M 12:40 – 13:40 & F 12:40 – 2:30
Email: melikyazici@sabanciuniv.edu	Place: M FMAN L018 & F FMAN G060

Zoom: <https://sabanciuniv.zoom.us/j/8083097056>

Office Hours: On Monday at 13.40 - 14.30 or by appointment.

Assistants: [Enes Recep Turkoglu](#) and [Nezih Kaan Veziroglu](#)

Main References:

- Jan M. Rabaey, *Digital Integrated Circuits A Design Perspective*, Prentice Hall, 2003.
- Kang, Leblebici, and Kim, *CMOS Digital Integrated Circuits Analysis and Design*, Cambridge University Press, 2014.

Objectives:

- To develop the engineering skills to analyze and design CMOS Digital ICs.
- To introduce basic CMOS process technology to understand the structure, operational principles and circuit parameters of transistors used in digital design.
- To provide each student with the opportunity for completing a set of design projects that lead to the development of a small digital standard cell library.

Prerequisite: EE202 Electronics Circuits II

Tentative Course Outline:

- CMOS Technology Overview
- VLSI Design Flow and Standard Cell Implementation
- Inverter and Interconnects
- Combinational Logic Gates
- Designing Sequential Logic Circuits
- Dynamic Logic Circuits
- Semiconductor Memories
- Low Power Design
- I/O Circuits

Grading Policy: HW and quizzes (10%), Labs (30%), Midterms (30%),and Final (30%).

Important Dates:

Midterm #1 April 15, 2022
Midterm #2 May 27, 2022
Final Exam TBA by the University

Labs: Implementation of standard cell designs using Cadence Virtuoso (Inverter, NOR, NAND, Flip Flops and SRAM).

Quizzes: There will be pop-up quizzes to encourage participation.

Class Policy: Regular attendance is essential and expected.