

## CDA 4210 Introduction to VLSI Design

**Credits:** 3

**Text book, title, author, and year:** *Principles of CMOS VLSI Design*, by N. Weste & K. Eshraghian, Addison-Wesley, 2nd ed. ISBN=0-201-53376-6

- a. **Supplemental materials:** *Introduction to VLSI Circuits and Systems*, by J. Uyemura, Wiley, ISBN=0-471-12704-3

### Specific course information

- **Catalog description:** Exposes students to digital VLSI design and simulation tools with simple examples. Use of commercial state-of-the-art industrial CAD/CAE tools.
- **Prerequisites:** CDA 3201C, EEE 330 or permission of instructor
- **Required, elective, or selected elective:** selected elective

### Specific goals for the course

- **Specific outcomes of instruction:** By the end of the course students will: (i) develop an understanding of digital VLSI systems, which include device types, 3-D models, CMOS Technology; (ii) Design rules and diagrams; (iii) Understand Fabrication processes and techniques, and Layout Design and Analysis; (iv) Understand other VLSI design technologies will be discussed such as NMOS, Dynamic CMOS and transfer gate among others. Students will have a number of hands-on experiments and design assignments.

### Brief list of topics to be covered:

- Technology Review, Trends, New Technologies, and Levels of Abstraction.
- Semiconductor Physics, P-Type, N-Type devices, Reverse Bias, Forward Bias.
- MOS Transistors characteristics, 3-D Models, and Regions of Operation.
- CMOS Technology, Static CMOS Circuits.
- Design Rules, Stick Diagram, and Complex Static CMOS Circuits.
- Dynamic CMOS Circuits Design.
- Fabrication Processes and Techniques.
- N-MOS Technology, Technologies Comparison.
- LAYOUT Design and Analysis.