

**EE 4375/5378 VLSI DESIGN**  
**Fall 2019**

**Instructor:** Dr. John Moya  
**Office:** Engr. 305  
**Office Hours:** TTh 2-3, 4:30-5:30  
Th 1-2  
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**Course Location and Time:** LART 207 4:30 – 5:50 pm MW

**Course Description:** Introduces VLSI design and computer-aided VLSI design software. Projects are required that involve schematic capture, layout editing, simulation, logic verification, and testing.

**Prerequisite:** C or better grade in EE 3338

**Textbooks:** 1) CMOS VLSI DESIGN: A Circuit and Systems Perspective 4<sup>th</sup> ed.  
by Neil Weste and David Harris  
2) Other documentation from class.

**Course Outcomes:**

- 1) Students will understand the properties of and be capable of analyzing circuits containing MOS transistors.
- 2) Students will be able to use CMOS design approaches to create basic logic gates, implement Boolean logic functions and simple logical circuits.
- 3) Students will understand the layout rules and the process used to build MOS circuits on an IC.
- 4) Students will become familiar with and be able to utilize modern VLSI CAD approaches to create and analyze a MOS design.

**Course Content:** Course is divided into two parts: theoretical and applied portions. Approximately ten weeks of the semester will be concerned with the theoretical portion and will entail coverage of material in the textbook. The remaining time will be devoted to practical learning.

**Absence Policy:** Make-up work is in general not possible and effort should be made to attend every class. The professor should be informed of any problems with attendance **at least a week prior to any absence** to allow for rescheduling of work for the entire class. In the event that an emergency or sudden sickness occurs, **inform the professor as soon as possible**. In such cases an oral quiz/exam may be administered to make-up a quiz/exam. A physician's note or a similar document may be required prior to such a make-up.

**Undergraduate Grading:** A 4 to 0 grading scale (as shown below) will be used to grade projects and exams.

- 4: concept is understood,**
- 3: concept is mostly understood,**
- 2: concept is halfway understood,**
- 1: concept is mostly not understood, and**
- 0: concept is not understood.**

Some scores between two of the above are sometimes given. In general, an average performance of 3.5 to 4 will earn an A, 3 to 3.5<sup>-</sup> a B and so on.

It is anticipated that four projects and two exams will be given. The weighting of the six assignments will be as follows:

- Exams: 20% of final grade each
- Cell Library Project: 20% of final grade
- Automated Design Project: 10% of final grade
- Path Delay Projects: 10% of final grade
- Final Design Project: 20% of final grade

After scaling the total score to a 4 point scale, an total performance of 3.5 to 4 will earn an A, 3 to 3.5<sup>-</sup> a B and so on. Thresholds between grades may vary somewhat (e.g. the threshold for a C might be lowered to 2.4). Class participation may be taken into account and could have a positive effect on your final grade. **In no case will a student with less than 2.0 overall average receive better than a D.** Any questions concerning an exam/project score must be brought up prior to the class meeting after the exam/project has been scored/returned. Any exams/projects not picked up within a week of the end of the semester will be destroyed. Any questions concerning final grades should be brought up within one week of grades being posted to Goldmine.

**Graduate Grading:** Grading will follow the general outline set for undergrads above. However, graduate students can expect some differences in assignments and exams. These differences can include different problems and projects. In general, graduate students should also expect strict grade boundaries with no threshold shifts and no curves.

**Academic Dishonesty:** “Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed regulations, as printed in the *Handbook of Operating Procedures*, and available in the Office of the Dean of Students and the homepage of the Dean of Students at [www.utep.edu](http://www.utep.edu), may result in sanctions ranging from disciplinary probation, to

a failing grade in the work in question, to a failing grade in the course, to suspension or dismissal, among others.” (Quote from the Undergraduate and Graduate Catalog)

**Accommodation under the ADA:** For disability accommodation, contact the Center for Accommodations and Support Services at 747-5148, go to room 106E in the Union, or e-mail [cass@utep.edu](mailto:cass@utep.edu).

### **Exam Etiquette**

Unless an exception has been approved by the instructor in advance, the following will be enforced during exams:

- 1) No caps, hats, or similar can be worn during exams.
- 2) Ears must be visible.
- 3) Only standard, basic prescription eyeglasses can be worn. No sunglasses.
- 4) Only T-shirts and other standard, simple shirts, and jeans and other simple pants or shorts are allowed. Simple blouses as well as dresses and skirts, can be worn for an exam. No cargo pants/shorts. No coats, hoodies, or similar can be worn during exams. No heavy clothing layering is permitted, but a simple cardigan-type sweater may be worn with approval.
- 5) No book bag is permitted at the desk during exam.
- 6) All exams are closed book and closed notes.
- 7) No watches, calculators, cell phones, tablets, laptops or other electronics allowed at desk during exam. Only pencils and an eraser are allowed. Pencils must be standard, hand-sharpened types (Bring several to exam.). Only small erasers (3” x 1” maximum size) are allowed. No pens or mechanical pencils. Medical equipment may be allowed with instructor permission.

