

EE5310-001 Digital VLSI Design

Fall 2016, Tu/Th 9:30 AM – 10:50 AM, ERB 129

INSTRUCTOR: Sungyong Jung, Associate Professor, EE Department.

Office: 252 Nedderman Hall, Email: jung@uta.edu, Phone: 817-272-1338

Office Hours: 8:00 AM – 9:20 PM on Wednesday (Other times by appointment)

<https://www.uta.edu/profiles/sungyong-jung>

RECOMMENDED TEXTBOOK: John P. Uyemura: “CMOS Logic Circuit Design”, KAP, 1999.

REFERENCES:

1. J.M. Rabaey, A. Chandrakasan, and B. Nikolic “Digital Integrated Circuit: A design perspective”, New York: Prentice Hall, 2nd edition, 2003.
2. S.M. Kang and Y. Leblebici, “CMOS Digital Integrated Circuits Analysis & Design”, 4th Edition, McGraw Hill, 2014.
3. David A. Hodge, Horace G. Jackson, and Resve A. Saleh, “Analysis and Design of Digital Integrated Circuits in deep submicron technology”, McGraw Hill, 2004.
4. N.H.E. Weste and D. Harris, “CMOS VLSI Design: A circuits and systems perspective”, 4th Edition, Addison-Wesley, 2010.
5. Christopher Saint and Judy Saint, “IC Layout Basics”, McGraw Hill, 2001

GRADUATE TEACHING ASSISTANT: TBD

COURSE DESCRIPTION: This course gives an introduction of the VLSI design Process. It also covers advanced circuit techniques using CMOS technologies and design methodology used for developing digital VLSI circuits. In this course, the logic families will be covered as well as VLSI system components analysis and design.

ATTENDANCE POLICY: At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students’ academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, Students are expected to attend classes regularly. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients “begin attendance in a course.” UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student, a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

DROP POLICY: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. Students will not be automatically dropped for non-attendance. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

HOMEWORK: Assignments will be given (almost) every other week, and they are due at the beginning of the class, unless otherwise specified. No late homework will be accepted.

EXAMS: There will be two midterm exams. All tests will be comprehensive, close books and close notes. No make-up exam will be given unless approval is obtained prior to the scheduled test date.

IMPORTANT DATES:

Midterm exam 1: 10/13/2016

Midterm exam 2: 11/17/2016

GRADING POLICY:

Assignments: 10%

Pop Quizzes: 20%

Midterm Exam 1: 35%

Midterm Exam 2: 35%

GRADING SCALE:

A: 90 and above, B: 80 to 89.99, C: 70 to 79.99, D: 60 to 69.99, F: below 60

TENTATIVE COURSE OUTLINE:

1. An Introduction and overview of design process
2. Layout and Simulation using various software
3. MOSFET Processing Technology
4. MOSFET Theory
5. Circuit Characterization and Performance Estimation
6. Logic Design with MOSFET
7. Elements of Physical Design
8. Electronic Analysis of Basic CMOS Logic Gates
9. Advanced Techniques in CMOS Logic Circuits
10. General VLSI System Components
11. Arithmetic Circuits in CMOS VLSI

AMERICANS WITH DISABILITIES ACT: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act* (ADA). All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

ACADEMIC INTEGRITY: It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. According to the UT System Regents' Rule 50101, §2.2, "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."

STUDENT SUPPORT SERVICES AVAILABLE: The University of Texas at Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. These resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals to resources for any reason, students may contact the Maverick Resource Hotline at 817-272-6107 or visit www.uta.edu/resources for more information.