EEDG/CE 6301 Course Syllabus – Spring 2023

Student Resources

Students who have tested positive for COVID-19 or may have been exposed should not attend class in person and should instead follow required disclosure notifications as posted on the university's website (see "What should I do if I become sick?")

COVID-19 Resources
Comets United webpage: check frequently

FAQ: check out the FAQs and reach out to your instructor or academic advisor if answers are not included

Student Resources: a variety of resources are available to help students to obtain counseling, health care, and academic support.

Course Information

Course Number/Section	CE/EEDG 6301.001
Course Title	Advanced Digital Logic
Term	2023 Spring
Days & Times	Tuesday and Thursday 4:00 – 5:15PM
Meeting Place	*ECSW 3.250 &* eLearning Blackboard Collaborate (recorded)

Professor Contact Information

Professor	*William Swartz*
Office Phone	*x- 3555*
Email Address	*bill-swartz@utdallas.edu*
Office Location	*ECSN 3.210*
Office Hours	*M 10 am* *Tu Th 11:30 am-12:30 pm and by appointment*

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisite: CE/EE 3320 or equivalent

Course Description

Modern design techniques for digital logic. Logic synthesis and design methodology. Link between front-end and back-end design flows. Field programmable gate arrays and reconfigurable digital systems. Introduction to testing, simulation, fault diagnosis and design for testability.

Student Learning Objectives/Outcomes

The objective of this graduate level course is to introduce the modern design methodologies for digital logic and automatic synthesis of digital systems. We provide students with access to the CAD tools to use hardware description language to model, analyze and design various digital circuits/systems. It is expected that the students will acquire a clear understanding of the main techniques, design strategies and the optimizations that are involved in modern digital circuit modeling, design and synthesis. In particular, the following are the course learning objectives:

- **CLO1:** Understand the role of optimization and ability to apply multi-output and multi-level optimizations in digital circuit design.
- **CLO2:** Ability to design asynchronous sequential circuits using systematic approaches.
- **CLO3:** Understand the basic process of VLSI testing, stuck-at fault model, fault simulation and the concept of design-for-test methodologies (scan and built-in self-test).
- **CLO4:** Ability to understand and apply graph-based algorithms and linear programming for scheduling, binding and resource sharing in high-level synthesis.
- **CLO5:** Use VHDL/Verilog and CAD tools for optimization, simulation and synthesis.

Required Textbooks and Materials

Required Texts

none

Required Materials

none

Suggested Course Materials

Suggested Readings/Texts

* *H: Digital Logic Design,* Brian Holdsworth and Clive Woods, Newnes Pub. (Elsevier Science), 2002.
* *J: Testing of Digital Systems,* Niraj Jha and Sandeep Gupta, Cambridge University Press, 2003.
* *D: Synthesis and Optimization of Digital Circuits,* Giovanni DeMicheli, McGraw Hill 1994.
* *M: Logic Design Principles,* Edward McCluskey, Prentice Hall 1986.
* *Computer Aided Logical Design with Emphasis on VLSI,* Frederick Hill and Gerald Peterson, John Wiley 1993.
* *Logic Synthesis,* S. Devadas, A. Ghosh and K. Keutzer, McGraw Hill, 1994.

Suggested Materials

Additional materials linked on eLearning

Assignments & Academic Calendar

Topics, Reading Assignments, Due Dates, Exam Dates

Homework will be due at the beginning of class unless otherwise announced.
Midterms: Thursday March 2, 2023 during class hours (tentatively)
Tuesday March 28th, 2023
Cadence Certification: Friday May 5, 2023
Final examination: TBD

Classroom Conduct Requirements Related to Public Health Measures

UT Dallas will follow the public health and safety guidelines put forth by the Centers for Disease Control and Prevention (CDC), the Texas Department of State Health Services (DSHS), and local public health agencies that are in effect at that time during the Spring 2022 semester to the extent allowed by state governance. Texas Governor Greg Abbott's Executive Order GA-38 prohibits us from mandating vaccines and face coverings for UT Dallas employees, students, and members of the public on campus. However, we strongly encourage all Comets to get vaccinated and wear face coverings as recommended by the CDC. Check the Comets United: Latest Updates webpage for the latest guidance on the University's public health measures. Comets are expected to carry out Student Safety

protocols in adherence to the Comet Commitment. Unvaccinated Comets will be expected to complete the Required Daily Health Screening. Those students who do not comply will be referred to the Office of Community Standards and Conduct for disciplinary action under the Student Code of Conduct – UTSP5003.

Grading Policy

Homework/Quizzes: 10%
Cadence Certification: 10%
Midterm: 40%
Final examination: 40% (cumulative)

Homework will be due at the beginning of class unless otherwise announced via eLearning.
Video quizzes: Announced via eLearning available all day.

Computer resources during class
This class will make heavy use of the NoMachine during class sessions

Course Policies

Make-up exams
Only by permission of the instructor BEFORE the regularly scheduled examination date

Extra Credit
none

Late Work
Homework assignments will be considered late at 11:30 PM the Friday after they are due, and will not be graded without a valid excuse.

Special Assignments
none

All-or-nothing grading
Tests and homework will be graded as either correct for full credit or wrong with no credit. Problems with multiple steps will be graded all-or-nothing for each step. The only exception will be multiple choice questions where you may explain your reasoning.

Class Materials
The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course, however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Attendance

The University's attendance policy requirement is that individual faculty set their course attendance requirements. Regular and punctual class attendance is expected. Students who fail to attend class regularly are inviting scholastic difficulty. In some courses, instructors may have special attendance requirements; these should be made known to students during the first week of classes. Faculty have the discretion to set an attendance policy for their in-person meetings, but the absences due to COVID-19 cannot be counted against a quarantined student.

Class Participation

Regular class participation is expected regardless of course modality. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Recordings

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

The instructor will record meetings of this course. These recordings will be made available to all students registered for this class if the intent is to supplement the classroom experience. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law.

Classroom Citizenship

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

Academic Support Resources

The information contained in the following link lists the University's academic support resources for all students.

Please see http://go.utdallas.edu/academic-support-resources.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please review the catalog sections regarding the credit/no credit or pass/fail grading option and withdrawal from class.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.