Course	**CS 4341.003**
Course Title	**Digital Logic & Computer Design**
Professor	Richard Goodrum
Term	Spring 2021
Meetings	Tuesday-Thursday 11:30 A.M.-12:45 P.M.

Professor's Contact Information

Office Phone	972-830-6333
Other Phone	(972) 883-2185 (CS Department Phone Number)
Office Location	ECSS 4.604
Email Address	Richard.Goodrum@UTDallas.edu
Office Hours	10:00-11:00 A.M. Tuesday & Thursday
Other Information	The best way to communicate outside of class is through office hours or UTD email. Use email to set up appointments outside the office hours. Anticipate email responses, typically within one business day, during standard business hours (8:00 AM to 5:00 PM Monday through Friday).

Course Modality and Expectations

Instructional Mode	Live Virtual Classroom (Mode 4: Remote) https://www.utdallas.edu/fall-2020/fall-2020-registration-information/
Course Platform	BlackBoard Collaborate
Expectations	Attend live sessions. Read the textbook before the associated class, answer the questions, and work the problems. Complete assignments early.
Class Recordings	Class recordings will be made available. Posting or maintaining copies outside eLearning is prohibited.
Asynchronous Learning Guidelines	If you choose the asynchronous option, it is still your responsibility to complete all assignments on or before the due date. https://www.utdallas.edu/fall-2020/asynchronous-access-for-fall-2020/

General Course Information

Pre-requisites, Co-requisites, & other restrictions	Pre-requisites: CE 2310 or EE 2310 or CS 3340 or SE 3340 or TE 3340 PHYS 2326 Co-requisite: CS 4141/TE 4141
Course Description	Fundamentals of real-time operating systems. Construction and organization. Specific constructs, functions, and services. Processes, threads, communication, synchronization, etc. Design and development of applications in a realistic RTOS environment.
Learning Outcomes	After successful completion of this course, the student should have: 1. Ability to analyze, minimize and design gate-level combinational logic circuits using Boolean algebra and 3 and 4 variable Karnaugh Maps. 2. Ability to analyze and design simple synchronous sequential circuits 3. Ability to analyze, design and utilize digital logic components such as adders, multiplexers, decoders, registers, and counters. 4. Ability to understand RAM and ROM memory components, and utilize these in digital logic design 5. Ability to design computer components such as Arithmetic-Logic-Unit (ALU) and data path Ability to understand the basics of hardware description languages such as Verilog or VHDL.
Required Texts & Materials	**REQUIRED TEXTBOOK:** Digital Design – A System Approach (2012), Dally & Harting, Cambridge University Press, ISBN: 9780521199506. **SUGGESTED TEXTBOOK:** Computer Organization and Design, Fifth Edition, by David A. Patterson & John L. Hennessy, Morgan Kaufmann, 2014. ISBN: 978-0-12-407726-3. **SUGGESTED READING:** Logic and Computer Design Fundamentals, Fourth Edition, by M. Morris Mano and Charles Kime, Prentice Hall, 2007. ISBN: 978-0-13-198926-9. **OTHER MATERIALS:** Other materials including the syllabus, assignments, slides, the publication describing Logisim, etc. will be posted on eLearning. https://elearning.utdallas.edu We will be using a software application called Logisim as an aid to learning about digital logic circuits. Logisim is available for download free at: http://www.cburch.com/logisim/index.html

Assignments & Academic Calendar

Week	Dates	Reading Assignment	Chapter	Homework	Program	Exam
1	19-Jan,21-Jan	The Digital Abstraction: Combinational Logic: Verilog	1,3,7.1, A			
2	26-Jan,28-Jan	Combinational Logic Design	6,7			
3	2-Feb,4-Feb	Combinational Building Blocks	8,9		1	
4	9-Feb,11-Feb	Numbers and Arithmetic	10,11	1		
5	16-Feb,18-Feb	Combinational Review				1
6	23-Feb,25-Feb	Sequential Logic	14			
7	2-Mar,4-Mar	Data Path State Machines	16			
8	9-Mar,11-Mar	Factoring State Machines	17		2	
	16-Mar,18-Mar	Spring Break				
9	23-Mar,25-Mar	Microcode	18	2		
10	30-Mar,1-Apr	System Design	20,21,22			2
11	6-Apr,8-Apr	Pipelining	23			
12	13-Apr,15-Apr	Timing	15			
13	20-Apr,22-Apr	Metastability and Synchronization Failure	27,28		3	
14	27-Apr,29-Apr	Sequential Logic Review		3		
15	4-May,6-May	Interfaces, Interconnect, and Memory Overview and Wrapup	22,24,25			3

Important Dates and Times	First day of class: 19 Jan 2021 Exam 1: 19-21 Feb 2021 Exam 2: 2-4 Apr 2021 Exam 3: 7-9 May 2021

Recommendations:

1. Read the textbook cover to cover at least three times.
2. Work all of the questions/problems in the book.
3. Make a concerted effort to complete and turn in all assignments early.
4. Attend every class.
5. Ask and answer questions in class.
6. Seek additional help when the information is still unclear.

Course Policies

Grading Criteria	Exams: 40%, Programs: 40%, Homework: 10%, Participation: 10%
Grading Scale	A – at least 93 B – at least 86 but less than 93 C – at least 78 but less than 86 D – at least 70 but less than 78 F – less than 70 To make a C or better, a raw grade of 50% or higher must be achieved on each program and exam. To make a B or higher, a raw grade of 70% or higher must be achieved on each program and exam.
Exams	Exams will allow a single attempt during a multi-day window.
Make-up Exams	Make-ups will be offered only if the student has a valid medical reason and produces a doctor's letter (in English) for the specific date. Blanket letters will not be accepted.

Programming Assignments	Programming assignment have a maximum grade of 50% unless they:
	   a. Produce correct results.
	   b. Which are reproducible by the grader from <u>submitted</u> materials.

Submissions	Assignments will only be accepted via eLearning. Submissions via any other form will be ignored. Reports must be in Microsoft Word or LibreOffice Writer formats. PDF and other formats will be ignored.
Grading	Only the last submission made at the time an assignment is being graded will be graded. All submission after the assignment's answer guide is posted will receive a raw score of 0.
Early Submissions	Early submission of Homework or Programs will result in a one point per day bonus with a maximum of five points per assignment.
Late Work	Late submissions will be penalized 25% of assignments value per day at each change of date.
Grade Disputes	Grades disputes must be submitted within two weeks of their release.
Class Attendance	A daily record will be encouraged. Failure to successfully complete the attendance record might result in a lower grade depending on the project chosen.
Classroom Citizenship	The instructor encourages students to take active part in class discussions. No question is too simple/stupid to be asked. So, do not hesitate.

Instructor Expectations	Students will:
	   a. Be on time to lectures.
	   b. Be attentive to lectures.
	   c. Be respectful of other's need to avoid distractions.
	   d. Perform their own work unless directed to participate in a group activity.
	   e. Avoid the use of any premade works of answers (the use of which constitutes cheating).
	   f. All student work will be typewritten.

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

Other University Supplied Materials

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

COVID-19 Guidelines and Resources

The information contained in the link lists the University's COVID-19 resources for students and instructors of record.

Please see http://go.utdallas.edu/syllabus-policies

Classroom Conduct Requirements Related to COVID-19

UT Dallas requires that all students must wear a face covering that covers the nose and mouth in all university buildings and classrooms. To help protect the health and safety of students, instructors, and the University community, students who choose not to wear a face covering may not attend class in person but may attend a course remotely. Anyone attending class in person without a face covering will be asked to put one on or leave. Instructors may end the class if anyone present refuses to appropriately wear a face covering for the duration of class. Students should also be sure they are at least six feet away from their fellow students and faculty, and seated in a seat that is designated to ensure that distance. Students who either refuse to wear face coverings appropriately or to adhere to other social distancing protocols may face disciplinary action for Student Code of Conduct violations. Students who are unable to comply with the university policies including wearing a face covering should consult the Comets United webpage for further instructions.

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?" webpage)

Class Attendance

The University's attendance policy requirement is that individual faculty set their course attendance requirements. Regular and punctual class attendance is expected regardless of modality. 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. These attendance requirements will not be used as part of grading (see Class Participation below for grading information).

In-person participation records may be used to assist the University or local public health authorities in performing COVID-19 occurrence monitoring. Please note – in-person attendance requires consistently adhering to University requirements, including wearing a face covering and other public safety requirements related to COVID-19, as presented in this syllabus. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

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 may record meetings of this course. Any recordings will be available to all students registered for this class as they are intended to supplement the classroom experience. 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. 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. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

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](#).