

ELC 2137 Digital Logic Design Lab

Fall 2020 Syllabus

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Office: Zoom Office Hours: MW 11 - 12am

1 Schedule

The schedule is the same for all sections.

Week	Dates	Assignment	Due
1	8/25, 8/27	Lab 1 Git and LaTeX Intro	
2	9/1, 9/3	Lab 2 Transistor Gates	L1
3	9/8, 9/10	Lab 3 Adders	P3, L2
4	9/15, 9/17	Lab 4 Subtractor	P4, L3
5	9/22, 9/24	Lab 5 Verilog Intro	P5, L4
6	9/29, 10/1	Lab 6 2-digit 7-seg	P6, L5
7	10/6, 10/8	Lab 7 BCD	P7, L6
8	10/13, 10/15	Lab 8 4-digit 7-seg	L7
9	10/20, 10/22	Lab 9 ALU	P9, L8
10	10/27, 10/29	Lab 10 4-Digit TDM	P10, L9
11	11/3, 11/5	Lab 10 4-Digit TDM	
12	11/10, 11/5	Lab11 FSM	L10
13	11/17, 11/5	Lab11 FSM	
14	11/24, 11/5	Lab 11 FSM	
15	12/1	Lab 11 FSM	L11
16	Final Time	Practical (quiz)	Practical

Please note that this schedule is subject to change as part of Baylor's ongoing response to COVID-19.

2 Introduction

In this laboratory course, you will gain practical experience with the tools and methods for designing, simulating, and implementing digital circuits. You will apply the concepts learned in lecture (ELC 2337) and produce working examples of combinational and sequential logic circuits.

3 Course Objectives

Upon completion of this course, students will:

- Be familiar with basic digital circuit building blocks (for example, decoders, multiplexers, shift registers) and be able to incorporate these fundamental logic circuits into larger, more complicated digital designs.
- Understand the electrical characteristics of fundamental combinational and sequential circuits and know how these characteristics impact digital designs.
- Be familiar with basic sequential circuit design methods and understand the use of flip-flops and latches.
- Know how to use modern software tools for designing and implementing digital systems.
- Have a working knowledge of Verilog for designing and simulating digital circuits.
- Be able to communicate technical information more effectively.

4 Prerequisites

Credit or concurrent enrollment in ELC 2337.

5 Materials

You do not need to purchase anything for this lab if you are doing them in person. You will be required to check out a Basys3 FPGA board. There is no cost, unless you lose or damage the items. Further instructions will be provided on the first day of lab. Lockers are available for storage in Rogers 305, and combination padlocks are available for check out.

You can use the ECS computers for all software. If you would like to have the software on your personal computer, you can download the two primary tools for free:

- LaTeX typesetting tools:
 - Overview: [LaTeX Project](#)
 - Compiler for Windows: [MikTeX](#) - This compiler includes TeXworks which is an editor or “frontend” for writing your LaTeX documents.
 - Editor used in lab: [TeXstudio](#) - This one has more features and a better layout.
- [Xilinx Vivado 2018.3](#) - WebPACK is the free edition. Make sure you’re getting the same version used in the labs (so your files work in both places).

If you will not have access to ECS computers, you will be required to download and install this software on your personal computer. Information will be provided to assist you in doing so.

6 Assignments

Some assignments will be individual, but most laboratories will be conducted as a group of 2-3 students. The instructor will assign students to a group and the groups will be changed halfway through the semester (after Lab 6).

Each laboratory exercise will require a report of some type, and specific instructions will be given with each exercise. Generally, these will be due at the beginning of the next lab session. Division of work during lab and for writing the report is left for the group to decide; however, **each student is responsible for reviewing all group reports and accepting its contents before it is turned in.**

Most exercises will also require a pre-lab assignment, to be done individually. The pre-lab due day/time & location will be given by your instructor.

The practical quiz, will be conducted online as a canvas quiz for each section. You will need to use a respondus browser for this activity, so please ensure you have a computer that can use the respondus browser.

Section	Date and Time
1 & 2	Monday, December 7 4:30 p.m. - 6:30 p.m.
3 (Online)	Tuesday, December 8 9:00 a.m. - 11:00 a.m.

7 Missed Labs and Late Work

If a student knows they need to miss lab for a university activity (e.g. sports team), the student should contact the instructor beforehand and make arrangements for completing the missed lab. If a student misses a lab unexpectedly (e.g. illness), they should contact the instructor as soon as possible afterward to make arrangements. In some cases, a Make-up Session is available for a student to complete a single missed laboratory. The actual laboratory missed will be the one conducted. The Make-up Session cannot be utilized to repeat a completed laboratory to attempt to get a better grade.

Unless otherwise arranged by or with the instructor, submissions will be considered late after the due date. Late reports will receive a 10% penalty up to two weeks, at which time, they will not be accepted (i.e. will receive a zero). Late pre-labs will receive a 10% penalty up to the start of that lab session, at which time, they will not be accepted (i.e. will receive a zero). No submissions will be accepted after the Practical.

8 Grading

Grades will be based on a weighted average of lab reports and the Practical quiz (85%), and pre-labs (15%). Missing items will be assigned a grade of 0. The Practical quiz must be completed to receive a passing grade. Final letter grades will be assigned as follows:

Letter	Minimum
A	93
A-	90
B+	87
B	83
B-	80
C+	77
C	73
C-	70
D	60
F	below

9 Rules, Policies, and Information

9.1 Attendance

During this unprecedented time of a global pandemic, class attendance must be approached differently from the way it would in a standard semester. If you are sick or have any symptoms (even if they are slight) that might relate to COVID-19, please stay home to protect yourself, your classmates, and your professors. As your instructor, I will expect that you work with me to enable you to receive any necessary course content (including class lectures) and complete any assignments, quizzes, or exams that you may miss due to being sick or having COVID-19-related symptoms. I also expect you to notify me prior to class if you will be missing for COVID-19 or any other health-related reason. If you are well, have no symptoms, and are not required to remain at home for any COVID-19 or other health-related reason, you should attend class and abide by all of the University's health protocols. Attendance during this time may take many forms due to the various course formats being offered this fall. Be sure to pay careful attention to the additional details below that describe how attendance and class participation will be incorporated into my course.

Importantly, Baylor's Health Services department on the Waco campus no longer provides notes to "excuse" students from missed classes. Please do not ask Health Services for such documentation.

9.2 Class Format Conversion

Due to the COVID-19 pandemic, this course may need to be converted to a hybrid or online format at some point in the semester. I have anticipated this possibility as I have prepared for the course, and will provide necessary information for you in that event.

9.3 Face Coverings

Baylor University is committed to providing a safe educational environment for all students, faculty, and staff. In order to create the healthiest environment possible, students and instructors must

properly wear face coverings over their mouths and noses while in Baylor buildings and while in the classroom. In addition, social distancing should be maintained within all classroom environments.

Any student who does not bring a face covering or refuses to wear one will be dismissed from class and be considered absent. If a student who is not wearing a face covering refuses to leave class, the instructor may dismiss in-person class for that day. Such a student will be subject to disciplinary action through the Student Code of Conduct.

9.4 Office hours

One of the best ways to take full advantage of learning in my course is by coming to my office hours. I am anxious to guide you in your academic pursuits. Take advantage of the hours listed above or email me for an appointment.

9.5 Classroom Protocol

I expect you to be mature about your education and courteous to others. This means several things, such as,

1. not coming to in person (lab, office hours) if you feel even slightly sick. I will record all the classes so you won't miss anything.
2. properly wear a mask (cover nose and mouth, etc.) the entire time you are in the building or around others.
3. being an active participant in class;
4. showing up on time each day ready for class
5. if you can't make it, you should make provisions to get notes and such so you learn;
6. being respectful of others;
7. not using cell phones or web surfing - if you don't want to be here, then don't sign up for class;
8. leaving class quietly to take an important call or go to an essential meeting, so as not to disturb others.

9.6 University Writing Center (UWC)

The University Writing Center offers free assistance to you at any stage of the writing process (brainstorming, researching, outlining, drafting, revising, editing). In their feedback, the consultants focus on higher order concerns, such as content, thesis, evidence, and organization, before grammar or style. The UWC tutors will not proofread, edit, or write your paper for you, but they will equip you with a toolbox of strategies to improve your writing, research, and editing skills. Real-time online consultations as well as eTutoring (feedback within 48 hours) are available during Baylor's 2020 summer sessions (June 2 - August 7). For your consultation appointment, please have the assignment prompt, your paper/text, and other materials you might need with you and provide

my name as your professor. Learn more and make an appointment at:www.baylor.edu/uwc, or email UWC@baylor.edu

9.7 Students Needing Accommodations

Any student who needs academic accommodations related to a documented disability should inform me immediately at the beginning of the semester. You are responsible for obtaining appropriate documentation and information regarding accommodations from the Baylor University Office of Access and Learning Accommodation (OALA) and providing it to me early in the semester. See www.baylor.edu/oala or email OALA@baylor.edu today if you have not done so already.

9.8 Academic Integrity

Plagiarism or any form of cheating involves a breach of student-teacher trust. This means that any work submitted under your name is expected to be your own, neither composed by anyone else as a whole or in part, nor handed over to another person for complete or partial revision. Be sure to document all ideas that are not your own. Instances of plagiarism or any other act of academic dishonesty will be reported to the Honor Council and may result in failure of the course. Not understanding plagiarism is not an excuse. As a Baylor student, I expect you to be intimately familiar with the Honor Code <http://www.baylor.edu/honorcode/>. For more information see the Baylor University Honor Code on the Academic Integrity Web page or contact the Office of Academic Integrity at 710-8882 or Academic.Integrity@baylor.edu.

9.9 Turnitin

Students agree that by taking this course, all required papers, exams, class projects or other assignments submitted for credit may be submitted to turnitin.com or similar third parties to review and evaluate for originality and intellectual integrity. A description of the services, terms and conditions of use, and privacy policy of turnitin.com is available on its web site: <http://www.turnitin.com>. Students understand all work submitted to turnitin.com will be added to its database of papers. Students further understand that if the results of such a review support an allegation of academic dishonesty, the course work in question as well as any supporting materials may be submitted to the Honor Council for investigation and further action.

9.10 Academic Success

We as faculty members have high academic expectations of you. However, every student who has been admitted to Baylor can be successful. I am a vigilant professor and will notice if you are struggling in my course. If your academic performance in this class is substandard, I will submit an Academic Warning to the Success Center during the sixth week of the semester. I will work to help you get the help you need to learn more fully, and I can assist you in finding the resources you need beyond my course. Familiarize yourself with the culture of success we have at Baylor by stopping by the Paul L. Foster Success Center in Sid Richardson or by going to: <http://www.baylor.edu/successcenter/>. Even if you don't need help, you can get involved by tutoring other students in the future or by telling a hall mate how and where to get help.

9.11 First Generation College Students

Baylor University defines a first-generation college student as a student whose parents did not complete a four-year college degree. The First in Line program at Baylor is a support office on campus for first-generation college students to utilize if they have any questions or concerns. Please contact First in Line at (firstinline@baylor.edu), call (254)710-6854, or visit <https://www.baylor.edu/firstinline/> to learn more about the services available.

9.12 Civil Rights Policy and Sexual and Interpersonal Misconduct Policy

Baylor University does not tolerate unlawful harassment or discrimination on the basis of sex, gender, race, color, disability, national origin, ancestry, age (over 40), citizenship, genetic information or the refusal to submit to a genetic test, past, current, or prospective service in the uniformed services, or any other characteristic protected under applicable federal, Texas, or local law (collectively referred to as Protected Characteristics).

If you or someone you know would like help related to an experience involving:

1. Sexual or gender-based harassment, sexual assault, sexual exploitation, stalking, intimate partner violence, or retaliation for reporting one of these types of prohibited conduct, please visit www.baylor.edu/titleix, or contact us at (254) 710-8454, or TitleIX_Coordinator@baylor.edu.
2. Harassment (excluding those issues listed in #1) or adverse action based on Protected Characteristics, please visit www.baylor.edu/equity, or contact us at (254) 710-7100 or Equity@baylor.edu.

The Office of Equity and Title IX understands the sensitive nature of these situations and can provide information about available on- and off-campus resources, such as counseling and psychological services, medical treatment, academic support, university housing, advocacy services, and other forms of assistance that may be available. Staff members at the office can also explain your rights and procedural options. You will not be required to share your experience. **If you or someone you know feels unsafe or may be in imminent danger, please call the Baylor Police Department (254)710-2222 or Waco Police Department (9-1-1) immediately.**

Except for Confidential Resources, all University Employees are designated Responsible Employees and thereby mandatory reporters of potential sexual and interpersonal misconduct violations. Confidential Resources who do not have to report include those working in the Counseling Center, Health Center and the University Chaplain, Dr. Burt Burleson.