



Electrical and Computer Engineering Department
EE 4142 Digital Systems Design II -Laboratory
EE5190 Advanced Digital Systems Design -Laboratory
Spring 2021

- ❖ **Lab Description:** Design and verification of digital systems using simulation. Laboratory implementation using standard, integrated circuits and programmable logic devices.

- **Corequisite EE4342:** The content of the lab assignments is associated with this class. Please note that the lab is 1 credit hour, and the grade for that lab is calculated separately from the grade in the class.
- **Lab sessions:** The student is responsible for completing the labs, and meeting with the Teaching Assistant at the formally scheduled time assigned to the section in which the student registered.
- **Course Outcomes:** At the end of this course students will be able to:
 - Utilize the standard design sequence outlined below to create Digital Logic Systems
 - Use the Xilinx ISE development environment to implement designs;
 - Implement Digital Logic Systems in various forms;
 - Design via Verilog (HDL) or schematic capture modules found in the development platform.
- **Overall Design Sequence:**
 - I. Design Creation (Schematic or HDL)
 - II. Synthesis (Create design into a gate-level netlist)
 - III. Constraints (Specify timing constraints and I/O assignment)
 - IV. Implementation (Compile design into place and route design)
 - V. Result Analysis (Run a test bench and look at ISM simulation results to make corrections if necessary)
 - VI. Debug (Close ISM, edit, and try again)
 - VII. Device Programming (Download design into device)

- ❖ **Course Format: Hybrid with Synchronous & Asynchronous components**
 - Accessible **asynchronous** content → *Asynchronous* means students will be able to access resources {lab assignments, recorded video lectures, and other provided materials} at their own time (without a designated time) **and work at their own pace**. Lab resources will be delivered via our lab Blackboard shell in asynchronous mode. Please be proactive and complete these academic activities by diligently keeping track of your own progress. You will be able to submit lab materials using the tools located in our Lab Blackboard shell.

- **Synchronous lab sessions** → **Starting the second week of classes** (week of January 25th) students are **expected and required** to meet remotely with corresponding TA once a week by login into Blackboard Collaborate for a virtual lab session during their designated day and time as stated on Goldmine.
 - What is the **purpose of the specific day/meeting time**? It is crucial that we keep the scheduled day/time so students can meet with their TA in a live-virtual session to do **demonstrations of lab assignments**. During these live-sessions students will have the opportunity to ask questions {on chat or audio/video} and share screens as they complete the synchronous demonstrations.
- A “**Lab Schedule ~ Week-by-week**” explicit calendar will be provided to help you be proactive and diligently keep track of the synchronous and asynchronous lab activities that must be completed each week. Make sure to monitor your own progress specially as you work on the asynchronous activities and **meet the posted deadlines**.

❖ **Technology Requirements:**

- **Blackboard (BB) shell** - Course content is delivered via the Blackboard Learning Management System (LMS), where you will find all our course resources, announcements, virtual offices, virtual lab room for synchronous lab sessions, lab assignment handout, etc. Make sure to **accesses all the additional resources posted on Blackboard (recorded-mini-lectures, ‘how to..’ instructions, reference materials, etc)**
 - **Internet connection** that allows one-on-one video conferencing via **Blackboard Collaborate sessions with TAs during virtual lab sessions and/or virtual Office hours** (live one-on-one communication)
 - Use **@miners e-mail account** – official class communication should using this domain
 - **Access to a laptop/desktop** – Device must be enabled with **webcam, microphone and** ability to install **required software**.
 - **Device capable of running Xilinx ISE 14.7** {installed on your device or accessed via MyApps or via VPN to a local work station in any of the two on-campus Laboratories} – instructions are posted on Lab Blackboard.
 - **Create PDF files** -- be able to create PDF files to upload assignments {*by converting directly from Word to PDF, use a scanner or use a scanning App*}
- 📌 Please take a look at the “**To-Do List**” posted in the Lab Blackboard shell, you will be expected to complete all those tasks to be ready to take part in the laboratory learning activities. **Your designated TA will provide more details about these requirements during first lab session.**

❖ Communication

- **Discussion Boards** within the Blackboard shell -- Will be used for frequently asked questions, technical issues, and discussions of constructive content related to our laboratory. If you need help, **please check out the discussion board to see if your question has been answered previously, and if not, participate in the discussion boards by posting your question, comments or thoughts!** Please respond to other students' questions if you have a helpful response, this will help create a sense of community and will give you an opportunity to engage with your classmates.
- **Virtual Office hours** -- If you require help, please remember you can reach out to your TA during lab session, via email or by visiting during Virtual Office hours
- **Classroom NetEtiquette/ Student Conduct** -- Remember that you must be courteous, respectful and professional in the way you address others; either in writing (email, chat, discussion boards), during lab sessions or during one-on-one sessions at virtual office with instructor and lab TAs. Therefore, please keep these netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action
 - Respect and courtesy must be provided to classmates, TAs and instructor at all times. No harassment or inappropriate postings will be tolerated.
 - When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a F2F situation.
 - Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted in these online spaces is intended for classmates and instructor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space. If students wish to do so, they have the ethical obligation to first request the permission of the writer(s).

❖ Course Grading:

Grades

Grading will be based on the standard scale

90% > A

80% - 89% = B,

70% - 79% = C,

60% - 69% = D,

Below 59% = F.

Point distribution for each lab:

Pre-lab.....20%

Demonstration

Schematic / HDL.....20%

Simulation20%

Quiz10%

Lab report. 25%

Attendance/Preparedness.....5%

❖ Laboratory Guidelines:

Each lab grade is determined by the following components:

1. **Pre-lab (20%)** – Students will get the corresponding laboratory assignment handout one week *before* going to the lab session. Students are responsible for completing the pre-lab activities and must submit their completed work via Blackboard tools by the due date. Pre-lab activities include important preliminary **design** of the lab assignment.

Failure to complete the pre-lab will seriously hinder your ability to complete the in-lab work.

- **Uploaded Pre-lab** work may be handwritten but afterwards it **MUST** be transformed into a single legible PDF file. **DO NOT submit work as separate picture files**, make sure your submission is a single **PDF file**.
 - *If you do not have access to a scanner, you may use other tools/programs in your computer or a smartphone application that creates a **single-PDF-file** from multiple captures made from your phone's camera. Such applications allow you to edit/add/remove pages/images and create a final PDF document. Such file must be organized in the corresponding order and the name of the file must follow this format: "Lastname_Prelab#X"*
2. **Demonstration (40%)** – Demonstration via **Blackboard Collaborate Ultra** during corresponding lab session. Students need to attend their lab session **with their corrected pre-lab to be used for reference**. After completing the **lab procedure work**, students need to demonstrate their results to the TA well *before* the end of their lab session. Students must have pre-lab and working circuit ready at time of demonstration. **Demonstration will begin well before the session ends** to give opportunity to all students to show their work. Demonstration consists of:
 - a. Show your completed circuit in **schematic/HDL** form –**20%**
 - b. **Simulation** of completed circuit – **20%**
 - c. **If the circuit simulation doesn't work by checkout time**, you still need to show your work. **DO NOT leave the lab session without showing your progress to the TA** (to receive partial credit where applicable and make any arrangements *if* deemed necessary by the TA).
 3. **Quiz (10%)** – During demonstration, the TA will assess the student's understanding of the lab assignment and implementation. Students should be ready to answer oral questions pertaining to the lab design and implementation.
 4. **Lab report (25%)** – Students must prepare a lab report, and submit it as a single PDF file by the due date. The report **must** contain legible screen capture/files of each schematic and waveform simulations. The lab report **MUST** include 5 parts in the **EXACT** order as described below:
 - a) **Cover page** - With student's name, lab name, lab session, lab number, and due date
 - b) **Instrumentation used** – List the software used (**hardware would be listed for Face-to-face versions of the lab*)
 - c) **Design Implementation** – Each student will describe the steps used during the design process and how it was implemented. Include **CLEARLY LABELED** schematic(s) and any coded HDL modules (with corresponding comments beside the code)
 - d) **Results** – Include simulation (waveforms) along with corresponding explanation/interpretation of the results.
 - e) **Conclusion** – Paragraph about the assignment and lessons learned

* **Points will be deducted for each item that does not follow the format**
 5. **Attendance/Preparedness (5%)** – Students must attend corresponding lab session and be on time. Students **must** come well prepared: this means you **must** review resources such as videos, handouts, prelab solutions and instructions ***before*** the session.

- ✚ **Graduate Students:** If you are a **graduate student** taking this lab as part of your degree plan, please note that you are responsible for completing all work required of undergraduates **and**, in addition you are expected to:
- Successfully complete a **final project** (worth **10 %** of the final grade); and
 - **Maintain an 80% average** (minimum)
- Failure to comply will warrant a failing grade in the lab

❖ **Course & University Policies**

- **Attendance** - Attendance is **mandatory** and is key to your success in the lab. You are required to attend your corresponding section of the Lab by using Blackboard Collaborate Ultra and to **be on time**.
- **Resource access** - Each week you will be able to access a *Lab Module (content folder on Blackboard)* containing all resources corresponding to such lab assignment. *Blackboard generates reports with statistics of user's access.*
- **Deadlines** – All deadline times are local El Paso (Mountain Standard Time zone.)
- **Lab Reports** should be written by each student **individually** and uniquely in his/her own style but following the order of the required lab report parts.
- **Late assignments** will NOT be accepted without **written** medical, legal, military, or work justification. Special circumstances will be considered if reported in time. Makeup labs are by appointment only and require the TA approval.
- **Samples** of student work will be collected for quality assurance purposes. Please notify the professor, in writing, if there is any confidentiality requirement about any work that is submitted.
- All work must have good **presentation and be legible** to obtain full credit.

Copyright statement for course materials: All materials used in this laboratory (such but not limited to recordings, assignments, handouts, quizzes) are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. **You may not be further disseminated (i.e., share, send or post) any class materials/resources outside of this course. Doing so may result in disciplinary action**

Academic Dishonesty: As an entity of The University of Texas at El Paso, the Department of Electrical and Computer Engineering is committed to the development of its students and to the promotion of personal integrity and self-responsibility. The assumption that a student's work is a fair representation of the student's ability to perform forms the basis for departmental and institutional quality. All students within the Department are expected to observe appropriate standards of conduct. Acts of scholastic dishonesty such as cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in the 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 will not be tolerated. Any case involving academic dishonesty will be referred to the Office of Student Conduct and Conflict Resolution (OSCCR). See the OSCCR homepage at <http://sa.utep.edu/osccr/> for more information.

American Disabilities Act: If you feel you may have a disability that requires accommodations, contact the Center for Accommodations and Support Services (CASS, <http://sa.utep.edu/cass>) at 747-5148 located in the Union East, Room 106.

COVID-19 Accommodations -Students are **not** permitted on campus when they have a positive COVID-19 test, exposure or symptoms. If you are not permitted on campus, you should contact me as soon as possible so we can arrange necessary and appropriate accommodations.

COVID-19 Precautions: You must **STAY AT HOME** and **REPORT** if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at <http://www.screening.utep.edu>. If you know of anyone who should report any of these three criteria, you should encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to COVIDaction@utep.edu.

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website (screening.utep.edu) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to class or campus when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection. Wear face coverings when in common areas of campus or when others are present. You must wear a face covering over your nose and mouth at all times in this class. If you choose not to wear a face covering, you may not enter the classroom or other facilities. If you remove your face covering, you will be asked to put it on or leave. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be dismissed from the class and will be subject to disciplinary action according to Section 1.2.3 Health and Safety and Section 1.2.2.5 Disruptions in the UTEP Handbook of Operating Procedures