### EECS 270 Lab

Introduction to the Lab W21 Hybrid Edition

#### Lab Instructor

- Background
  - University Affiliation (Undergrad, grad, faculty, etc)
  - Area of Study and Interests
- Contact Info
  - Email
  - Office
- Office Hours
  - Open Lab Hours

### Lab Assignments

Lab assignment are posted on the lab webpage at http://www.eecs.umich.edu/courses/eecs270/labs.html or go to the Pages tab on the Canvas course site.

All the lab materials you need will be posted there.

# Support Model

#### **In Person Home Lab Support**

- Attend your scheduled home lab for priority support.
- Two rooms will be used.
  - 270 lab EECS 2322
  - CAEN lab EECS 2331 (adjacent wall)
- An electronic help queue will be used from https//oh.eecs.umich.edu/courses
  - Include in help queue request
    - Home Lab or Visitor Status
    - Indicate Room(CAEN LAB or 270 Lab), station #, or remote
    - Link to Google meet or Zoom

# Support Model

#### **Remote (not in person) Home Lab Support**

- Please don't use the remote support zoom if you are in the lab.
- Login to Zoom at (we need the link)
- Use the electronic help queue as described above
- You will receive help based on your position in the queue.
- You will likely be asked to share your screen or show your design working on LabsLand (see below).

# Support Model

#### In Person Open Lab Support

• There is currently no In-Person Open Lab Support.

#### **Remote Open Lab Support**

- You may attend any of the remote open lab support times with equal priority.
- Use the electronic help queue as described above
- See the listing below and posted on the lab webpage for times.

#### W21 Lab Hours

	Mon	Tu	Wed	Th	Fr	Sat	Sun
9:00 AM	9 - 10:30		9 - 10:30	9 - 12			
9:30 AM	270 Lec	9:30 - 12:30	270 Lec	270 open	9:30 - 12:30		
10:00 AM		270 Home Lab		Connor	270 Home Lab		
10:30 AM		Pedram	10:30 - 1:30		Sharon		
11:00 AM			270 open				
11:30 AM			Sarthak				
12:00 PM							
12:30 PM							
1:00 PM							
1:30 PM		1:30 - 4:30	1:30 - 4:30	C	an Conn	la Calar	dan
2:00 PM		270 Home Lab	270 open	See Google Calendar			
2:30 PM		Pedram	Sharon	ſ			
3:00 PM	3 - 6			for weekly Hours			
3:30 PM	270 Home Lab						
4:00 PM	Connor						
4:30 PM		4:30 - 7:30	4:30 - 7:30	4:30 - 7:30	4:30 - 7:30		
5:00 PM		270 Home Lab	270 Home Lab	270 Home Lab	270 Open Lab		
5:30 PM		Bryce	Sarthak	Daniel	Daniel		
6:00 PM	6 - 9						
6:30 PM	270 Open Lab						
7:00 PM	Bryce						
7:30 PM			7:30 - 10:30				
8:00 PM			270 Open Lab				
8:30 PM			Pedram				
9:00 PM							
9:30 PM							
10:00 PM							

# Attending Other Labs

#### EECS 270 Labs

- You may attend other EECS 270 home labs.
- You may only receive help after home section students!
- If it is a particularly busy lab, you may not receive help for the entire period!
- The Home labs are particularly full this semester. Please realize that visiting students may wait a long time to get help. Attend your Home lab or and open lab for priority help.

# Lab COVID rules—EECS 270

- You must have read the lab Operating Procedure (on the website under "overview") before attending lab.
- Basics
  - You must wear a mask at all time per University rules.
  - No eating or drinking in the lab.
  - When a lab instructor is helping you in person you, and the instructor, must both be wearing a face shield.
  - You are to stay in your seat during lab. Try to minimize trips outside of the lab (bathroom etc.)
- Face shields
  - You will be given one face shield.
    - You are to take it with you. We recommend cleaning it on a regular basis.
    - If you don't have a face shield with you, you may not ask for help in lab.
    - If you break or lose your face shield, it is your responsibly to find and purchase another one (although we have some spares).

# Assignment Components

- Pre-Lab
  - Preliminary lab work that can be completed outside the lab:
    - Simulations
    - Answers to pre-lab questions
    - Attend open lab if you need additional help before the lab!
- In-Lab
  - Functional demonstration on lab kit
- Post-Lab
  - Answers to post lab questions
  - May contain simulations or brief write-up

# **Submission Policy**

- Pre,Post lab assignments must be submitted to your Gradescope home lab section.
- The instructor will provide you with a code that will allow you to sign up for your Gradescope section.
- Assignment components need to be submitted as a **composite** (1) PDF file:
  - Verilog Code
  - Schematic Images
  - QSF Constraint Listing
  - Answers to Questions
  - Simulation Waveforms
  - Handwritten scanned materials
- See Suggestions Link
  - A link is listed with the first lab with suggestions for creating composite PDF file.
  - Various tools are available to integrate
    - PDF Integrators
    - Word Processors

#### **Example Composite Submission**



#### Submission Policy Continued

- In-lab demonstrations must be certified by a 270 lab instructor.
  - Print the In-lab certification sheet and fill in the student part.
  - Demonstrate to any 270 lab instructor.
  - The instructor will **verify** your demo and **collect** the certification sheet.
  - Take a picture of the signed demo sheet and submit it on Gradescope.
  - Demonstrate your lab with over Zoom with Labsland.
  - Your instructor will issue you a reference number.
  - Write the reference number in the instructors signature line.

## Submission Policy cont

- Lab components are due according to the schedule posted on the lab webpage. (next slide)
- Pre and Post labs may be submitted up to this time electronically without penalty.
- In-labs may be certified in lab anytime before this time without penalty.
- Lab materials submitted after this time will be subject to 5%/day late penalty the first day and 10% subsequent days of the total value.
- To be considered for a late penalty waiver, contact your lab instructor and the lab coordinator, *Matt Smith matsmith@umich.edu* as soon as possible. Waivers will be considered for documented illness and other extenuating circumstances.

## Submitting Late Assignments

- Gradescope does not have a provision for submitting late work.
- Email your instructor the late assignments.
- Be sure the assignment components are in pdf format.

### In Lab Submissions

- Print the Demo Sheet
- Your lab instructor will verify your demo, sign and date the sheet.
- Take a picture of the demo sheet and submit it on Gradescope.
- The instructor will keep the hardcopy as evidence of your demo.

### Remote Demo Submissions

- Print the Demo Sheet
- Demonstrate your lab with over Zoom with Labsland.
- Your instructor will issue you a reference number.
- Write the reference number in the instructors signature line.

#### Sample Assignment Schedule

Week #	Date (Mon)	Lab Starts	Pre Lab Due	In Lab Due	Post Lab Due	Exceptions	Conflicting Events
1	9/2	Quartus Tutorial and Lab 1				no preparation necessary	
2	9/9	Lab 2		1	1		
3	9/16	Lab 3	2	2			
4	9/23		3	3part1	2		
5	9/30			3part2			

#### **Typical Lab Schedule**

Week 3: In-Lab 1 and Post-Lab 1 Due

**Schedule Exceptions** 

Week 2: There is no PreLab 1

# Grading Cycle and Reporting

- Labs will be graded in 1 week or less after the due date.
- Graded labs will be on your **home** lab section Gradescope site including In-lab scores.
- Review your graded materials and grades.
- Notify the instructor soon after the posting for change consideration.
- Grades will also be on Canvas on a per lab basis.

### Book Bags

- The lab isles are narrow, so be sure to keep your book bags out of the isle.
- You can place them under the desk.

#### Food and Drink

• No Food or Drink is allowed in the lab.

# Emergency Exit

- In the event of an emergency alarm, you must exit the building.
- **DO NOT** exit into the parking area between EECS and the Auto Lab as seen out of the lab window.
- Use center stairs and **EXIT via the atrium** and out either end preferably toward the bell tower.
- In the event that someone needs medical attention, there is a campus phone on the instructors desk. Dial 911 for Campus Safety.

#### General Lab Support Policy

- You are expected to develop debugging and development skills over the course of the labs.
- The lab instructor is available to tutor and provide support in these methods.
- The lab instructor will attempt to assess your problem and recommend a path of action to help YOU debug the problem
- You should pursue this path and consider how it addresses your problem before consulting the instructor again.
- Do not expect to resolve hardware debugging issues with a few words from the instructor or a simple recommendation.
- Hardware debugging takes time, but can be productive if approached in a systematic and constructive manner.

# 270 Homework Support

- 270 Lab Instructors are only prepared to provide lab support.
- You should always use the course GSI office hours first for homework support.
- You should always email the course GSI for homework issues and questions.
- You may ask a 270 Lab Instructor for homework support, but keep in mind you should always check with the course GSI for correctness.
- 270 Lab Instructors will always give priority to lab support.

# Email Support

- While it is possible to address minor issues with email, it is generally very difficult to address lab issues with email.
- In the lab, the instructor can interact with you much easier and assess the problem quicker.
- Instructors are not allocated time for extensive email support.
- The best way to get lab support is to go to open lab or your home lab!

### Collaboration

- All lab work in 270 is done individually
- You may seek help or discuss such problems with others such as:
  - CAD tool use, for example:
    - How do I find this function?
    - How do I make this connection?
  - What does this error mean?
  - DE2 kit details, for example:
    - How do I program the FPGA?
    - Where is this switch?
- You may not discuss or provide help on specific solutions to lab design problems or questions with others.



#### Altera DE2 Kit



### Alternate Lab Resources

- DE2 Kits
  - Academic offer available from Altera
  - See Altera Web Site for details
- Quartus Software
  - Free Web Pack from Altera (download)
  - Runs under Windows OS, but compatible with Linux Versions.
  - Good for doing design entry and simulations
  - Must import your project files to run in lab or use removable media ie USB drive
- CAEN Labs
  - Quartus is available under Linux Boot (and Windows)
  - Can use AFS file space which is accessible in 270 lab
- CAEN Remote Connection with VNC (recommended)
  - Just like being in the 270 lab or CAEN lab (without the kit)
  - Great for doing design entry, simulations, etc

### LabsLand

- LabsLand provides for DE2 on kit testing remotely.
- You can try your designs as if you are physically in the lab.
- You will receive an invite to there website before your first lab.
- See the video tutorial posted with the introductory lab on how to use it.

# Today's Assignment

- Do Tutorial
- You will Learn:
  - Basic Design Entry
    - Express your logic design in abstract form (schematic)
  - Simulation
    - Check the functionality of your design
  - Synthesis
    - Converts your design into a form that can program the FGPA
  - FPGA Programming
    - Program the FPGA on the DE2 and check your logic function
  - Basics of DE2 Kit
    - Switches and LEDS