Computer Engineering Senior Design Laboratory

Policies and Guidelines

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Lab Overview

The Computer Engineering Senior Design Laboratory (henceforth known as the *CpE Lab*), located in NSB 215, is a shared space for the design, assembly, and testing of cyber physical projects by students at the University of Florida. For the safety and enjoyment of all students, this document outlines the lab's capabilities and operating policies. In order to gain access to the lab, students must read this document and agree with its guidelines regarding the safe and respectful use of the space and equipment.

General Lab Policies

Treat the lab area with respect so that students can enjoy the space for years to come.

- No food or drink is allowed in the lab, with the exception of well-sealed water bottles. If you need to eat, please leave the lab to do so.
- Keep your space clean and ready for other students after you leave. For exceptions (such as leaving a test setup in place for multiple days), talk to the Lab Manager.
- Treat others with kindness and respect. Speak quietly. Do not play music out loud.

The CpE Lab contains equipment for electronics testing and assembly and software development. Students are expected to supply their own consumables (solder, flux, parts and components, 3D printer filament, etc). Additional materials for student use are available for loan; contact the lab manager for more information.

There are 12 workstations in the lab's main area, each with the following equipment:

- Rigol DSO2302A Oscilloscope
- Rigol DP832a Power Supply
- Rigol DM3068 Benchtop Multimeter
- Rigol DG1032 Function Generator
- Asus 27" 4k monitor with DisplayPort and HDMI connectors
- USB Type A Keyboard & Mouse

Test Equipment Usage Policies

Please treat all the equipment with respect. This includes:

- Gently handle all probes, knobs, and connectors. Never force anything to fit.
- Clean up after yourself. Return all cables and parts back to their original locations.
- If you have any questions about how to safely or properly use a piece of equipment, ask the TA or Lab Manager on duty.

In addition to the test equipment listed above, the lab contains equipment for soldering and inspection of small scale electronics. This includes:

- Multiple hand-help soldering irons
- A reflow oven for SMT soldering
- A hot-air rework station
- A microscope for inspection of printed circuit boards

Soldering Equipment Usage Policies

- Be careful! All soldering equipment gets very hot and can easily burn you if handled improperly (i.e. touched).
- Only use soldering equipment in a designated area. Soldering fumes are toxic, and should only be used in the soldering room or at a station with a fume hood.
- Be gentle. The microscope is a sensitive instrument. Please do not touch any of the glass components with your skin, and be careful when adjusting the instrument.
- Ask for help. If you are not familiar with how to use an instrument, talk to the Lab Manager, who will be happy to assist you.
- When using a hand-held iron, always keep the tip clean. This includes having a damp sponge available to wipe the tip between uses.
- Turn off the equipment when you are done using it. An iron left on for an extended time will quickly destroy the tip.

The CpE Lab houses a *Microcomputer Museum*, showcasing some of the revolutionary and influential computing platforms of the last few decades. Please enjoy the museum without touching or moving any of the platforms.

Lab Safety

Ahere to these basic safety guidelines specified by UF Environmental Health & Safety when working in the CpE lab:

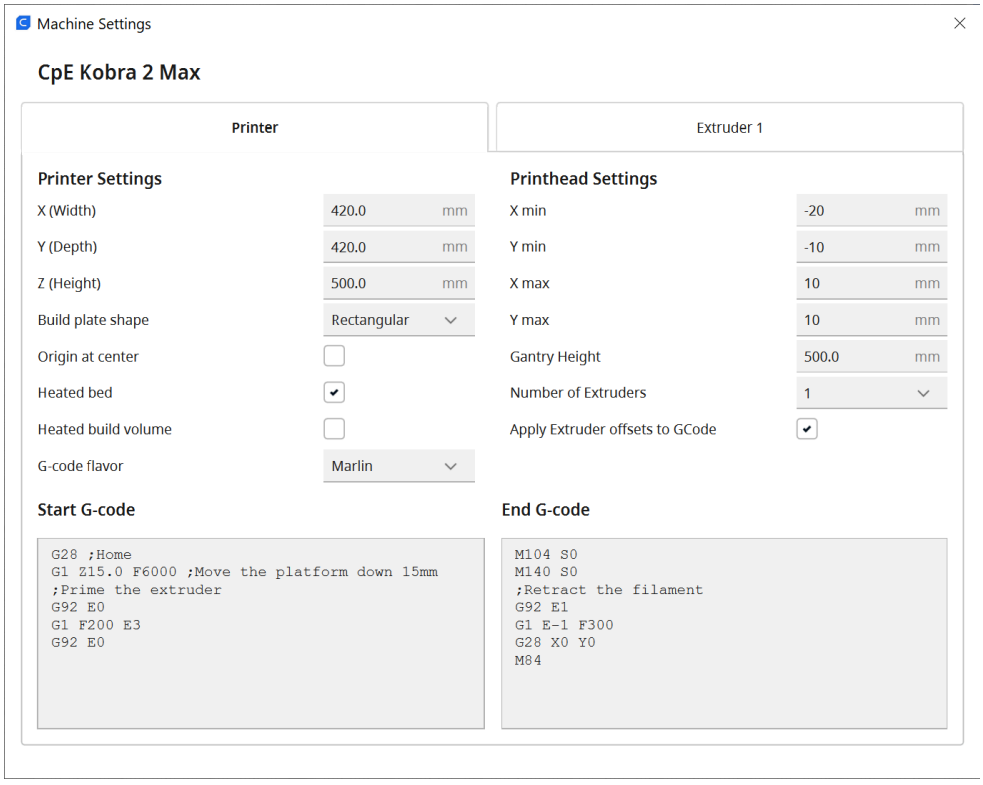
3D Printing

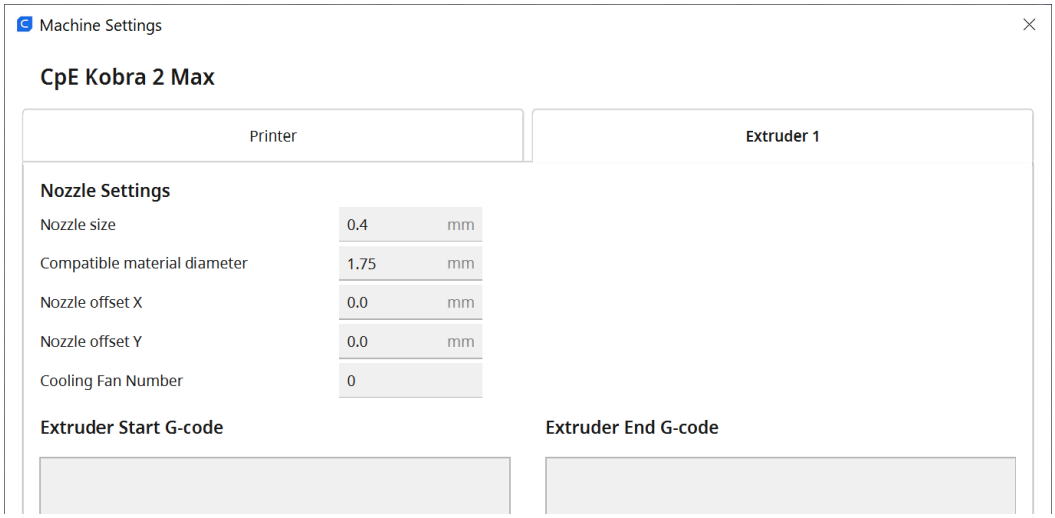
The CpE Lab has one FDM 3D printer and one resin 3D printer. Use of the resin printer is available through coordination with the Lab Manager. The FDM printer is available for use by students. The following are general usage instructions.

Initial Setup

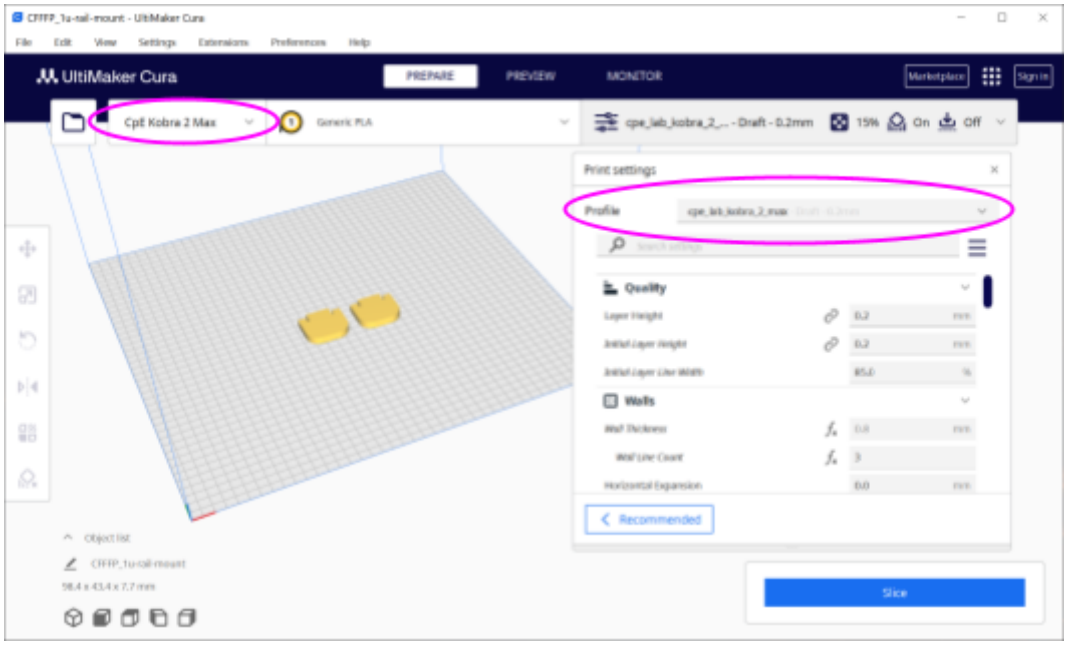
If this is your first time using the printer, you must set up the software required to properly slice models for printing. Here we provide instructions for using Ultimaker's Cura slicer.

- Download the program from here, and install it on your computer. The version as of this writing is 5.5.0.
- After launching the program, create a new printer by navigating to *Preferences* > *Configure Cura… > Printers > Add New*.
- In the *Add Printer* dialog, select *Non UltiMaker Printer*, then select *Add a non-networked printer*. From the selection options, choose *Custom > Custom FFF Printer*. Change the name of the printer to be more descriptive (e.g. "CpE Lab Kobra 2 Max"). Click *Add*.
- Next, select the printer you just added, and click *Machine Settings*. Adjust the settings to match what is shown here:





- Now that the printer is added to your slicer, you must configure the slicer settings. Download the provided Cura profile from here.
- In Cura, navigate to *Preferences* > *Configure Cura…* > *Profiles*. Then click *Import*. Select the profile you just downloaded.
- Finally, ensure that the profile you just imported is active in the *Print Settings* window.



- The provided profile balances print speed, finish quality, filament efficiency, and print success rate. Only adjust the slicer settings if you know what you're doing!

Design and Printing

- Design an appropriate model using your CAD software of choice. Be aware of certain limitations involving print volume, overhangs, fine details on the bottom layer, etc.
- Prepare the printer by preheating it, and making sure that there is sufficient filament for the model you are printing. (Ask Carsten or a TA for help if this is your first time using the printer)
- Load the model (STL format) into your slicer software.
- Copy the gcode generated by the slicer onto the USB thumb drive. Then, place the thumb drive into the printer (the right most USB slot).
- Select your file from the USB tab on the printer and touch *Print* to begin printing.
    - If the machine doesn't move right away, it is likely because the extruder or build plate are not up to temperature yet – be patient.
- Monitor the print, especially during the first few layers, to catch any failures and avoid wasting filament.
- Don't be afraid to ask for help! 🙂
- Be sure to place scrap plastic and failed prints into the recycling bin under the printer.