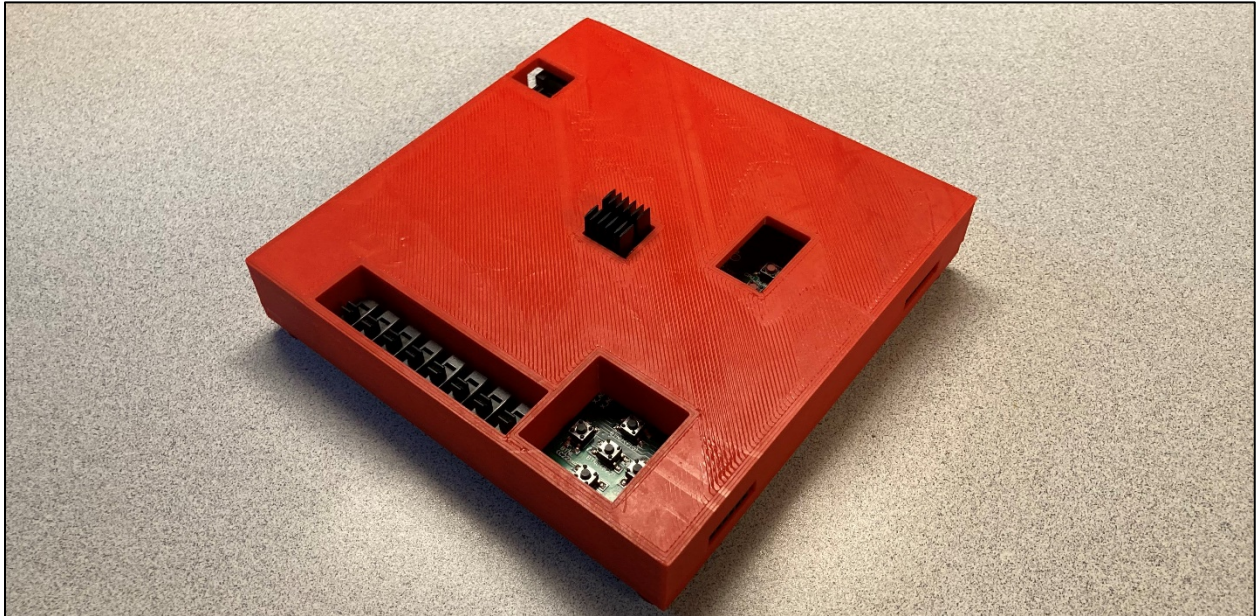# Digilent Nexys Video Board Case for ECE383

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This document provides a guide to 3D printing a case for your Digilent Nexys Video Board. The design provides for access to the power port, on/off switch, all four PMOD headers, the AUX cable ports, USB host, micro USB UART, micro USB JTAG (PROG) ports, all of the switches, directional buttons, and reset button, as well as DisplayPort out. If your design requires use of other components on the board, please feel free to modify the design, or to modify the design to personalize it. Links to the design on Thingiverse are included here (STL files that you can edit):

https://www.thingiverse.com/thing:4834841

I also included G-Code on Thingiverse that should work fine if you just want a plain one and are using the printers here. Just upload the G-Code to one of the printers, make sure you have the filament you want, make sure it's printing properly, and you're all set. If printing from the STL file, make sure the component is positioned properly (flat side down), and make sure you duplicate the feet (there's only one foot in the STL file) before you print.

In Cura if using the STL files, I suggest using the built-in profiles for the PLA+ and NinjaFlex. For material, select *PLA(Village Plastics)* for the top and bottom components, and select *NinjaFlex(NinjaTech)* for the feet. I also suggest printing at the "Standard" profile.

Required Hardware (available in the lab)

Hardware	Quantity	Part Number
6-32 x ¾ Machine Screw	4	1172388
6-32 Nut	4	1170705

Top Component
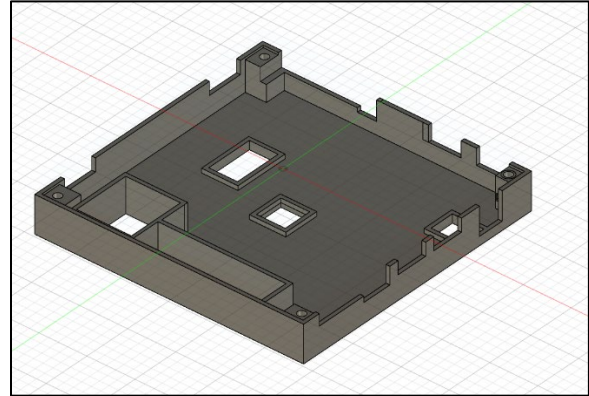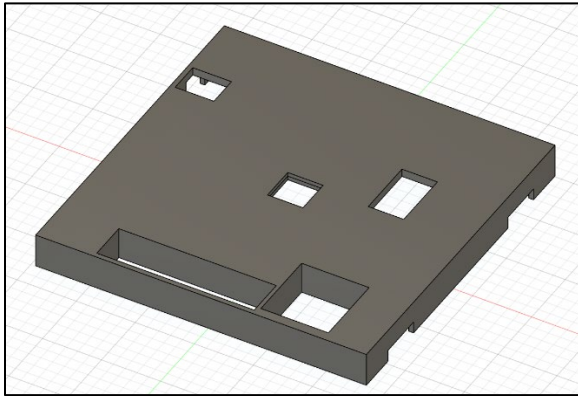
This case uses an embedded nut design in the top component. This means you'll have to wait around (or time it out) until the printer reaches to the level above where the nut should be inserted. From my testing at standard quality, level 35 is the last level that the printer leaves a space for the nut. Level 36 covers the nut with filament. **This means you should put all four nuts in at the end of level 35, and before the start of level 36.** Always check the "GCode Viewer" tab on Octoprint to confirm that your print follows the same trajectory. As an approximation, this should occur around 3 ¾ hours after the print begins. **Figure 1** and **Figure 2** show what this looks like in OctoPrint. Notice that the hexagon where the nut will be placed is empty in **Figure 1** and filled in for **Figure 2**. The nut will fit in there a little loose—don't worry about it, the tolerance a little wide, but it works great. Octoprint will probably also tell you it'll take like 18 hours. Don't worry about that—its' not under the honor code. It is lying to you. Expect about 5 hours. Patience is a virtue.
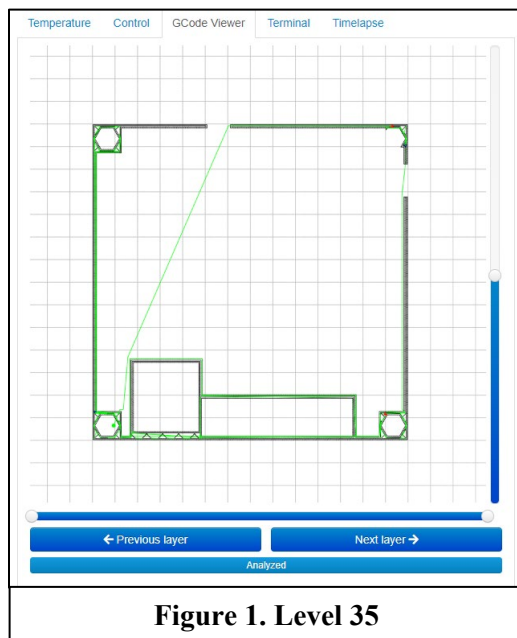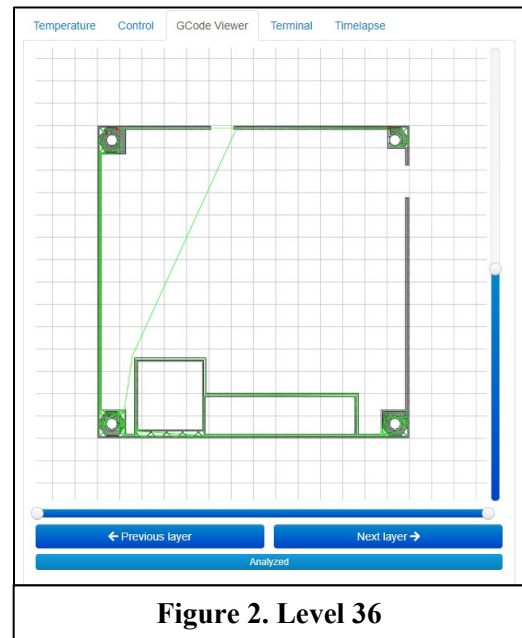

Figure 1. Level 35

Figure 2. Level 36

Make sure the printer does okay with printing immediately after this step so you ensure the entire print doesn't get ruined. If you would rather just screw the machine screws into the plastic and risk stripping, etc, then the part can easily be re-worked in Fusion. Reach out if you have questions on that… or Google.

The holes for the top component were designed a bit undersized so the machine screws have something to bite on to in addition to the captive nut. Run a drill bit through them (there's a drill in the lab) and it'll fit really nice. Alternatively, you can use a soldering iron to clean up any of the strands of filament that get caught in there.

Figure 3 shows the print just before you put the fasteners in. **Figure 4** shows the print just after you put them in, and **Figure 5** shows the print on the next layer. Notice this layer does adhere perfectly. This is okay. The nuts serve as more of a base than anything to the print has something to anchor to.
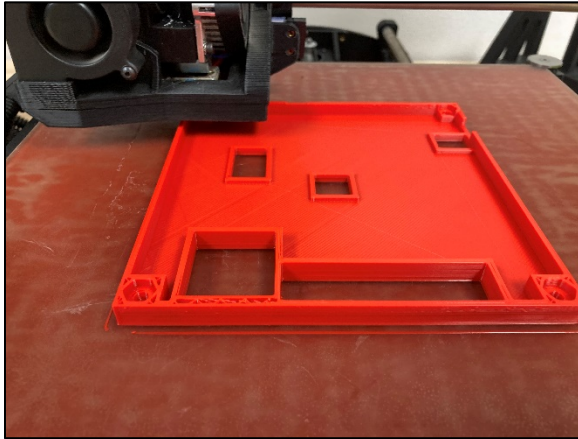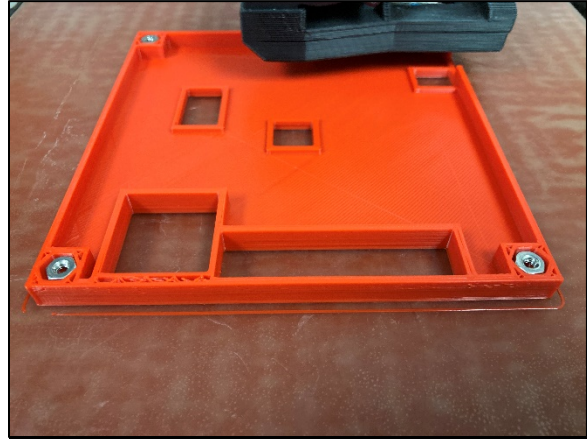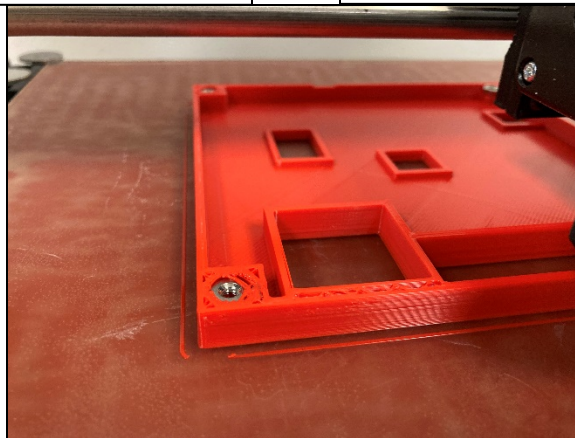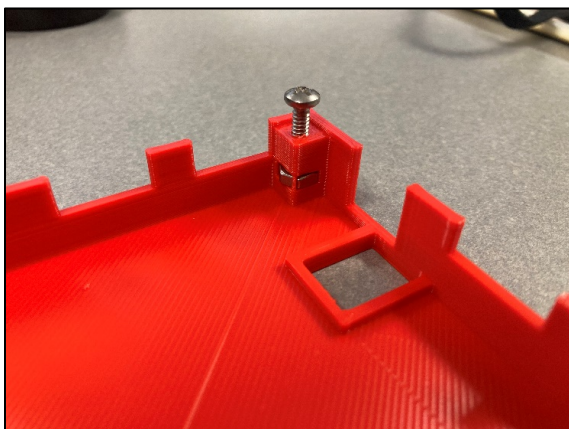

Figure 3. Beginning of Level 35

**Figure 4. End of Level 35**

**Figure 5. End of Level 36**

This shows what the back right post will look like after the print is done. The nut is exposed the way it is because there are connections on the board in this area that would interfere with the print. Unfortunately, it is possible that this nut may become loose (shouldn't be a problem with the undersized holes, but maybe). If it is an issue, use superglue to secure the nut. The rest of the nuts will be fully encased in filament, so they're secure.

Bottom Component
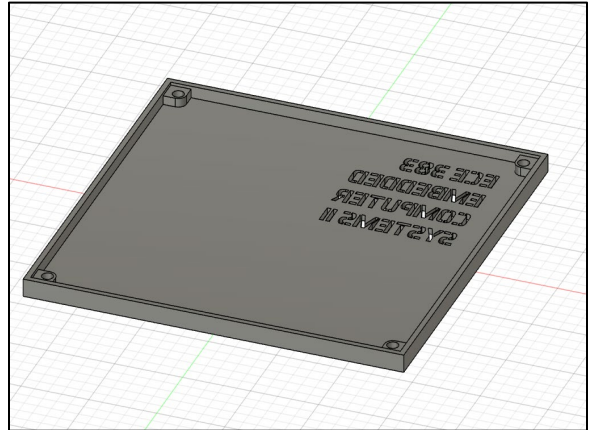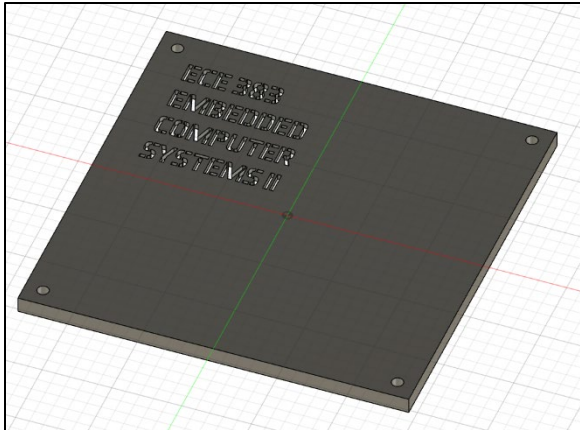
This one is pretty straight forward. Print with PLA and make sure the flat side is down. Other than that, should be good.

Feet
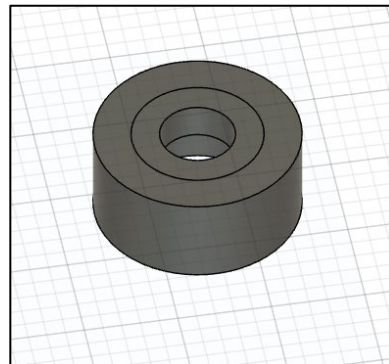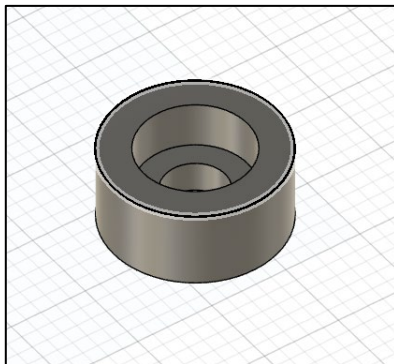
The only thing that makes these difficult is that they're designed to be printed in NinjaFlex. The included Cura NinjaFlex Profile does a pretty good job, however. Just make sure you select that profile and load the printer up with the NinjaFlex filament. These only take about 15 minutes to print. **Make sure you print 4 if you're printing from the STL file!** The G-Code file already has 4 ready to print.

Feel free to modify the design to your wants and needs. As an example, here is my rendition for my final project.