

# Installing the NGspice Simulation Environment for ECE 444

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- Step 1.** Download and install Matlab® version 2019b from <https://umaine.edu/it/software/matlab>. Click the Matlab icon and make sure Matlab® opens without any errors. If you experience errors, you may need to update your operating system or install additional libraries.
- Step 2.** Download and install CppSim from <http://www.cppsim.com/download.html>. This will install NGspice, the Spice simulation engine; Sue2, the schematic capture program; and CppSimView, the results browser, on your computer. Click the Sue2 icon. A schematic capture window should appear. Again, if you experience any errors, check the documentation at: [http://www.cppsim.com/Manuals/cppsim\\_vpssim\\_primer5.pdf](http://www.cppsim.com/Manuals/cppsim_vpssim_primer5.pdf) for possible sources of errors and try and correct any installation errors.
- Step 3.** Locate the CppSim directory on your computer. The CppSim directory should contain sub-directories including: SpiceModels, Import\_Export, Sue2, SueLib, SimRuns, CppSimShared, Netlist, ...
1. If using MS Windows 10, locate the file named `ngsim.m` in the `CppSim/CppSimShared/HspcToolbox` directory. Open the file using Matlab® or a text editor. On line 133, replace `win32` with `win64`.
  2. If using OSX or Linux, download the `spiceinit` file from <http://davidkotecki.com/ECE214/docs/ngspice/spiceinit>. Edit the file so that the lines beginning with `codemodel` all have a valid directory structure and point to valid `.cm` files. Rename this file `.spiceinit` and place in your home directory.
- Step 4.** Configure Sue2:
1. In the Sue2 schematic capture window, click: Tools → Library Manager. The Library Manager window should open.
  2. A Library is the name of a folder where you store schematics. Each schematic is referred to as a module. Sue2 comes with a lot of libraries which are not used in ECE 214. From the Library text box, select each library except for “devices” and “spice,” and click “Remove Library.” This will not delete the library from your computer, but will remove it from your current design environment.
  3. Create a new library to store your ECE 444 simulations. Click “Create” next to Library Operations. A “Create New Library” window will appear. Enter ECE444 as the library name, then click OK.
  4. Close Sue2.
- Step 5a.** Download the “ECE214\_devices library” from [http://davidkotecki.com/ECE214/docs/ngspice/ece214\\_devices.tar.gz](http://davidkotecki.com/ECE214/docs/ngspice/ece214_devices.tar.gz). Move this file to the “Import\_Export” directory within CppSim directory. Do not unzip this file.

- Step 5b.** Download the “ECE444\_devices library” from [http://davidkotecki.com/ECE444/docs/ece444\\_devices.tar.gz](http://davidkotecki.com/ECE444/docs/ece444_devices.tar.gz). Move this file to the “Import\_Export” directory within CppSim directory. Do not unzip this file.
- Step 6a.** Download the “ECE214 Spice Models” from [http://davidkotecki.com/ECE214/docs/ngspice/ECE214\\_SpiceModels.zip](http://davidkotecki.com/ECE214/docs/ngspice/ECE214_SpiceModels.zip). Move this file to the “SpiceModels” directory within the “CppSim” directory. Unzip this file. You should now have a number of files in the “SpiceModels” directory including a file called “ECE214\_models.mod”. If this file does not exist in the “SpiceModels” directory, check to ensure that you unzipped the the ECE214\_models.zip file in the correct directory.
- Step 6b.** Download the “ECE444 Spice Models” from [http://davidkotecki.com/ECE444/docs/ECE444\\_SpiceModels.zip](http://davidkotecki.com/ECE444/docs/ECE444_SpiceModels.zip). Move this file to the “SpiceModels” directory within the “CppSim” directory. Unzip this file. You should now have additional files in the “SpiceModels” directory including a file called “ECE444\_models.mod”. If this file does not exist in the “SpiceModels” directory, check to ensure that you unzipped the the ECE444\_models.zip file in the correct directory.
- Step 7a.** Start Sue2. Click: Tools → Library Manager. Click “Import Library Tool,” select the ECE214\_devices.tar.gz file and click Import.
- Step 7b.** Start Sue2. Click: Tools → Library Manager. Click “Import Library Tool,” select the ECE444\_devices.tar.gz file and click Import. Close and restart Sue2.
- Step 8.** Select the “ECE444 Library” in the Library Selection Box in the upper right hand corner of the schematic window. Click on the module called: “first\_module\_for\_ECE444.” Click: File → New Schematic. Enter “inverter” as the schematic name and make sure the destination library is ECE444. A blank schematic window should now appear. You can now begin to generate the schematic for simulation.

**You are now ready to design and simulate!!!**