

# Installing the NGspice Simulation Environment for ECE 445

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- Step 1.** Download and install Matlab® version 2023b or 2024a 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\\_vppsim\\_primer5.pdf](http://www.cppsim.com/Manuals/cppsim_vppsim_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 445. 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 445 simulations. Click “Create” next to Library Operations. A “Create New Library” window will appear. Enter ECE445 as the library name, then click OK.
  4. Close Sue2.

- Step 5.** Download the “ECE445\_devices library” from [http://davidkotecki.com/ECE445/docs/ece445\\_devices.tar.gz](http://davidkotecki.com/ECE445/docs/ece445_devices.tar.gz), and 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 these files to the “Import\_\_Export” directory within CppSim directory. Do not unzip these files.
- Step 6.** Download the “ECE214 Spice Models” from [http://davidkotecki.com/ECE214/docs/ngspice/ECE214\\_SpiceModels.zip](http://davidkotecki.com/ECE214/docs/ngspice/ECE214_SpiceModels.zip), and the “ECE445 Spice Models” from [http://davidkotecki.com/ECE445/docs/ECE445\\_models.zip](http://davidkotecki.com/ECE445/docs/ECE445_models.zip). Move these files to the “SpiceModels” directory within the “CppSim” directory. Unzip these files. You should now have a number of files in the “SpiceModels” directory including a file called “ECE214\_models.mod” and a file called “ECE445\_models.mod”. If these files do not exist in the “SpiceModels” directory, check to ensure that you unzipped the files in the correct directory.
- Step 7.** Start Sue2. Click: Tools → Library Manager. Click “Import Library Tool,” select the ECE445\_devices.tar.gz file and click Import. Close and restart Sue2.
- Step 8.** Select the “ECE445 Library” in the Library Selection Box in the upper right hand corner of the schematic window. Click on the module called: “first\_module\_for\_ECE445.” Click: File → New Schematic. Enter “schematic1” as the schematic name and make sure the destination library is ECE445.

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