

1. You will have access to multiple College of Design virtual machines (VMs). CP 6581 will require VMs with ArcGIS installed, and for class sessions we will start the semester using the K2GPU VM. You should open each VM available to you and check to see if ArcGIS is installed.
2. Here are a few general notes on VMs.
 - a. Because you will be a new user when you first start a VM, you may be prompted to set up Microsoft Explorer, Microsoft Edge, Adobe Creative Suite, or other software. You can close these windows and set up specific software later, if you wish.
 - b. Different VMs allow different degrees of customization. To customize right-click on an empty Desktop area and choose "Personalize". Change your background to a solid color that's a distinctive color so you can easily distinguish your virtual desktop from your local computer's desktop. Some VMs will remember your desktop color, other VMs must be re-set at each login, other VMs won't allow you to change the background color but may allow you to change a highlight color from the "Colors" item on the left menu just below "Background".
 - c. Your desktop will look exactly the same as physical computer's desktop except for the small black rectangle at the middle of the very top of the VM screen. Click on the rectangle and a pop-down horizontal menu of VM options will appear. Here are two useful options.
 - i. Preferences then File Access will allow you to grant VM access to your local computer's drives and files. Other options are available here as well.
 - ii. Window will toggle between full-screen and partial-screen.
 - d. There are two ways to exit from your VM.
 - i. "Disconnect" (available from the pop-down options menu) exits but keeps your VM running for about 30 minutes so you can re-connect if necessary.
 - ii. "Sign out" closes your VM. In general use "Sign out" to exit so we don't clog the VM server with orphan VMs.
 - iii. Both "Disconnect" and "Sign out" are available by right-clicking the Windows start button. "Disconnect" is available from the pop-down top menu, and "Sign out" is available from "Ctrl+Alt+Del" on the pop-down top menu.
3. We will be spending substantial class time programming in Python version 2.7. (Python version 3 has been available for some time, but ArcGIS Desktop requires Python 2.7.) We will be using the PyScripter Interactive Development Environment (IDE). There are many Python IDEs available, but PyScripter has the advantage of being highly customizable and completely portable. A "portable" software package can be moved from computer to computer and run without having to be installed by an administrator.
4. From a VM, copy the entire PyScripter folder from P:\!!!CP6581 to your Desktop. (The three !!!s are there to ensure that the folder appears near the top of alphabetical listing of folders on the P drive.)
5. Open your PyScripter Desktop folder and right-click on the PyScripter application. Choose "Create shortcut." Drag the new shortcut to your Desktop. You can now start PyScripter by clicking directly on the Desktop shortcut.
6. In the PyScripter Desktop folder right-click on the module1 Python file. Choose "Open with" then "More apps", then "Look for more apps on this PC", select "Desktop", then click on your new PyScripter shortcut. Check the box "Always use this app to open .py files. Now you can click on any Python file and it will automatically open in PyScripter.
7. Arcpy is the ArcGIS Python module that allows us to write Python programs to automate spatial analysis processes. On your current VM start PyScripter. In the bottom Python interpreter window it should tell you the Python version being used, which will be something like Python 2.7.16. At the ">>>" prompt in the interpreter window type "import arcpy as ap" and hit return. It may take a minute or two to load arcpy, but when you receive another ">>>" prompt without an error message you are ready to write Python code with the (almost) full geospatial analysis capabilities of ArcGIS.
8. At the ">>>" prompt type `ap.env.workspace = "c:\\users\\youruserid"` and substitute your GT userid.
 - a. We will be using this folder as the default location for CP 6581 classes.
 - b. Note: in Python (and arcpy) we must refer to folder levels with double-backslash ("\\") rather than Windows' single backslash ("\"). This is annoying for Windows users, but reflects a long-standing historical difference between Microsoft DOS/Windows and Unix-based operating systems. Python (like the R statistics package) was first developed in a Unix environment.