# ESCI451: Installing software on your laptop

In ESCI451 this trimester we are encouraging you to use Jupyter notebooks and Python for data analysis and illustration. As we will discuss in class, these tools provide a means of working efficiently, methodically and reproducibly with data sets of arbritary size and complexity. Jupyter notebooks in particular provide a way of combining notes, code, and output in the same document, which is very useful for teaching!

We recommend using Miniconda (<https://docs.conda.io/en/latest/miniconda.html>) as a way of managing the installation of Python and any other packages (e.g. Matplotlib, Pandas, NumPy) on your laptop, and then getting up and running with Jupyter notebooks. Miniconda is a lightweight version of the well-known Anaconda system (<https://www.anaconda.com/>), which more functionality than we need, and takes up a lot more space on your hard-drive.

Miniconda and Anaconda are both available in Mac, Windows and Linux flavours. For your personal computer you should follow the relevent instruction below. If you run into problems then you are welcome to ask Computing Systems Administrator Aleks Beliaev ([Aleksandr.Beliaev@vuw.ac.nz](mailto:Aleksandr.Beliaev@vuw.ac.nz)) or one of the course lecture staff for assistance in installing Miniconda. We encourage you to install the software yourself, or at least to download the software to your laptop so that we can help you through the actual installation.

*We recommend downloading the files referred to below while you’re on campus (unless you have unlimited broadband at home) as they can be quite large.*

## Mac

*If you’re unfamiliar with installing software on your Mac or get confused, you might find the video Aleks Beliaev has prepared helpful:* [*https://core.geo.vuw.ac.nz/f/01624bc2c9d649bab577/*](https://core.geo.vuw.ac.nz/f/01624bc2c9d649bab577/)*.* ***If you have a new mac that has an Apple M1 CPU*** *(You can check this by clicking on the Apple icon and selecting About This Mac. If it says Chip Apple M1)* ***please contact Calum Chamberlain before continuing.***

Go to the Miniconda download page, <https://docs.conda.io/en/latest/miniconda.html>, and download the file named “Miniconda3 MacOSX 64-bit bash” to your ‘Downloads’ folder.

Open the file at <https://raw.githubusercontent.com/calum-chamberlain/ESCI451-Python/master/environment.yml> which contains specifications of the Python packages we will be using in ESCI451. You should be able to right-click on this page and click “save page as” and save it to your ‘Downloads’ folder with the name environment.yml (note that your system may try to add a different file extension – make sure the file is saved as “environment.yml”).

Next, open a command-line interface, referred to as a “terminal”, by pressing Command+space and typing “Terminal” or by choosing “Terminal” from the ‘Applications’ folder .

Then enter the following commands in the terminal:

cd ~/Downloads

ls | grep Miniconda # This should output: Miniconda3-latest-MacOSX-x86\_64.sh

ls | grep environment # This should output: environment.yml

bash ./Miniconda3-latest-MacOSX-x86\_64.sh

conda env create -f environment.yml

The first three of these commands change your working directory and enable you to verify that you have both the downloaded files present. The fourth installs Miniconda: please accept all the default options. The fifth creates the working environment called “esci451”. (It may take a while.)

The final step is one you will **need to take each time you start an ESCI451 Jupyter notebook session**. Enter the following command in the terminal:

conda activate esci451

## Windows

Go to <https://conda.io/projects/conda/en/latest/user-guide/install/windows.html> and read it carefully!

Step 1 will take you to <https://docs.conda.io/en/latest/miniconda.html>, from where you can download the Python 3.9 version of Miniconda by clicking on “Miniconda3 Windows 64-bit” or “Miniconda3 Windows 32-bit”, depending on what type of computer have. (You can find out whether your laptop has a 64-bit (more modern) or a 32-bit Windows operating system by googling “Which version of Windows operating system am I running?”.)

Once you have down that, return to the previous page.

You can skip Step 2 and continue with Step 3 by double-clicking on the file you downloaded. Then click through to accept the default options you’re offered.

Once you have finished installing Miniconda and tested your installation as instructed, you can create an environment containing all the packages required for the ESCI451 Python modules. To do this, first download the file at <https://raw.githubusercontent.com/calum-chamberlain/ESCI451-Python/master/environment.yml>, which contains the environment specifications. (You can right-click and choose “Save as…” to do this. Note that your system may try to add a different file extension – make sure the file is saved as “environment.yml”)

Then open a terminal (AKA command line interface) by selecting “Anaconda Powershell Prompt (miniconda3)” from your laptop’s Start bar and run the following commands:

cd Downloads

conda env create -f environment.yml

source activate esci451

The first of these commands change your working directory and enable you to verify that you have both the downloaded files present. The second creates an environment called esci451, and will only be done once. **If the second command fails with a “File not found” (or similar) error then verify that the environment.yml file exists by typing entering ls to list the files in the directory and checking the name** (if the file is named something else like environment.yml.txt just change the name in your file explorer)**.** The third command activates the environment and **will need to be entered each time you use the ESCI451 notebooks**.

## Linux

Go to <https://conda.io/projects/conda/en/latest/user-guide/install/linux.html> and read it carefully!

Step 1 will take you to [https://docs.conda.io/en/latest/miniconda.html#linux-installers](https://docs.conda.io/en/latest/miniconda.html" \l "linux-installers), from where you can download the latest version of Miniconda by clicking on “Miniconda3 Linux 64-bit”.

Once you have down that, return to the previous page.

You can skip Step 2 and continue with Step 3.

Once you have finished installing Miniconda and tested your installation as instructed, you can create an environment containing all the packages required for the ESCI451 Python modules. To do this, download the file at <https://raw.githubusercontent.com/calum-chamberlain/ESCI451-Python/master/environment.yml>, which contains the environment specifications. You should be able to right-click on this page and click “save page as” and save it to your ‘Downloads’ folder with the name environment.yml (note that your system may try to add a different file extension – make sure the file is saved as “environment.yml”). Then, run the following commands:

cd ~/Downloads

conda env create -f environment.yml

source activate esci451

The first of these commands changes the working directory to the Downloads folder to which you saved the two key files. The second creates an environment called esci451 and will only be done once. The third command activates the environment and **will need to be entered each time you use the ESCI451 notebooks**.