**ECE 3822: Engineering Computation II**

**Homework No. 5: Running Compute-Intensive Jobs**

**Goal:** The goal of this homework is to demonstrate how to run a job on a remote server and monitor its performance.

**Description:** There are two major tasks:

1. Use rsync to copy files:
	1. Copy the files from your home directory on Amazon AWS (nedc\_999) (or any remote Linux server) to your desktop using rsync.
	2. Delete one to three files from your copy on your desktop.
	3. Re-run rsync and demonstrate that it only copies the deleted files.
	4. Use the Linux command touch or the equivalent under Windows to update the date of one of the files. Re-run rsync – it will re-copy this file if you use the standard options. Now touch the file again. Re-run rsync but use options that prevent rsync from copying the file (because the copy on your desktop is ‘newer’ than the copy on your server).

Note: If it is easier to copy from your laptop to your desktop because you are running Windows, you can do that. Just don’t load too many files onto nedc\_999 – keep your upload to less than 10M. Alternately, you should consider installing rsync under Windows – it is an extremely useful command.

1. Create a script called ece\_3822.sh that represents a compute intensive job. Have it loop for a very long time (e.g., indefinitely) and print out the date and time every one hour to stdout.
	1. Log into nedc\_999 and run this script in the background. Use top and ps to demonstrate that the job is running. Capture its output into a file called hw\_05.out.
	2. Log out of nedc\_999, killing the terminal session from which you ran the job. Log back into nedc\_999. Demonstrate that the job is still running. Document the date and time of this check. Discuss the priority level at which the job is running and compare this to the priority level it runs at when running the job interactively.
	3. Over the next 8 hours, check on the job at least three times, and demonstrate that it is still running and producing the proper output.
	4. Repeat this process without ever logging into nedc\_999. From your laptop, launch the job on nedc\_999 and demonstrate that you have run the job in the background on nedc\_999 (control returns to your terminal window on your laptop, but the job is still running on nedc\_999). Demonstrate that you can monitor its progress remotely and can stop and restart the job. Provide evidence that the job ran for at least 24 hours. You must do all this without ever logging into nedc\_999. (Hint: Google or man ssh and figure out how to launch the job in the background on nedc\_999.)

Later in the semester we will repeat this with a Python script that actually does something interesting.