Getting Started with R.

What is R? R is a free "open source" statistical package. Open source means that it exists on the contribution of researchers, academics, and business people around the world. The libraries of functions are shared in the community. This (similar to Linux) has its advantages and disadvantages over a commercial package such as SAS. R is both amazingly robust and sometimes ridiculously frustrating. But hey it's FREE.

Installation of R, the R community, and working with libraries.
The R website:
http://www.r-project.org/

To download R go to www.r-project.org and select the link to download R. Pick a mirror site and an operating system and then the folder called base. http://streaming.stat.iastate.edu/CRAN/

It is advisable to fish around the R website to find resources and help including the Introduction to R http://cran.r-project.org/doc/manuals/R-intro.pdf Almost all of the commands necessary for this course are in the intro document. Other manuals found at http://cran.r-project.org/doc/manuals/ and in general browsing around the site will find you most anything you want or just use Google.

Also there are a host of books for R many of them are free. Many of the libraries of packages have pdf tutorials. Or a nice list of books is here: http://www.r-project.org/doc/bib/R-books.html

Other useful links (all found from the R homepage)

The R Journal: http://journal.r-project.org/
Mailing lists: http://www.r-project.org/mail.html
Bioconductor: http://www.bioconductor.org/
R graphics page: http://addictedtor.free.fr/graphiques/
And this AMAZING link: http://cran.r-project.org/other-docs.html
This last link seems so unassuming but the amount of information there is simply unbelievable. Notice there are even differently languages including a Chinese reference card.

Some basic commands:

Help: Any time you want help just type a question mark then the command
Ex: ?hist will give help on making a histogram.

Executing code: It's easiest to start a new script file (don't forget to save it somewhere) by going to file then New Script. Then to run any code you've written just go to edit then run all or run selection or easier just highlight the desired code and do **CTRL-R** to run a block of code. To run a single line just put your cursor on that line and hit **F5**. Or of course type any command at the command prompt.

Comment code: In order to remember what you did you might want to make comments in your code file. Just precede any line of comment with a # sign.

Ex: #I'm trying to make a histogram

Entering Data: Give your data a name and then enter it via a "combine" statement.

Ex: myfirstdata=c(2,34,5)

Editing Data: There are numerous ways to edit data through commands. However a simple way is to go to Edit then Data Editor (the command window must first have the focus or highlight)

Import/Export Data: It is tedious to type in data. It is better to import it from a file. R handles many types of files for both import and export. Commonly these are "delimited" files such as .txt or .csv files. Use of the scan() function or read.csv() function is common. For info on use of these go to the intro manual above and see Chapter 7. Also for more advanced options see the R Data Import/Export manual. http://cran.r-project.org/doc/manuals/R-data.pdf

Setting the Working Directory: Lots of things in R are modeled after a Unix type environment. One of these is the path for execution. If you want to import a file or export a file you will have to explicitly state the path of the file and the filename in quotes. It is better to just set the working directory to the path of you data directory. Go to File then Change Dir and browse to the directory for your data.

Adding libraries of functions: Pretty much R comes as a fully realized statistics package but there are thousands of freely available libraries of functions that do specific things. To add libraries you do the following:

1. Open R
2. Got to packages and install packages.
3. It'll pop up and ask for a CRAN mirror. i.e. where do you want to download from? I always pick the US and pick Iowa State.
4. Choose the library you want to install.

But how do you know which library of functions you want? Try perusing the possibilities at….
http://streaming.stat.iastate.edu/CRAN/web/packages/
You can get there by browsing from the home page of www.r-project.org by selecting CRAN then your favorite CRAN mirror.

Hint of the day: Try CTRL-F in any document of webpage. That will start a "find" which is really nice on a page like the list of libraries so you can put in a keyword and it'll immediately go there.

Help in R. Well again your friend is Google. However from within R if you don't know the syntax of a specific command just type a ? then the command name. For instance ?rnorm will bring up help for the random normal number generator. ??rnorm will do more of a general search for that word. Sometimes if it's a function help you are looking for including the parenthesis with the function might help like ?rnorm() . There is also a help list thing on the internet but it's hard to use. Google is easier.