Summer/Winter/Semester2 **Tutorial 1** 2015

This self-study tutorial is an introduction to R.
It should be completed at home before your first class tutorial in Week 2.

1. Why R?

Throughout MATH1005 we use a statistical language called R. R provides a wide variety of statistical and graphical techiques and will upskill you to learn other statistical packages (eg in other courses or work environments).

2. Introduction to R

R is a programming language, which means it is not menu-driven. All commands are case sensitive and are written and executed in the console window at the prompt. However, there are certain tasks which can be implemented through the menus, like installing new packages. Data in R are organised as named structures. We will mainly deal with the simplest such structures: vectors and matrices. They can be numerical data (like height and weight) or categorical factors (like gender and type of diet). R treats factors and numerical data differently, and can combine them in a data frame. Each vector must contain elements of only one type. A data frame can contain columns of different types.

Statistical output is generated in the window (the R console) where the commands are executed, and graphs are produced in a separate graphics window.

To save results:
At home - Results can be copied and pasted to other programs (like a word processor) or can be saved as a text file, using the File menu. Graphs can be saved or printed by right-clicking on them and choosing the appropriate command.
In Labs - You can save any output onto a memory stick.

3. Downloading R

R is available in the computer labs in Carslaw. However we strongly recommend you download it onto your home computer so you can practise at home and use it for the reports. R is available free from from the CRAN (Comprehensive R Archive Network) website: www.r-project.org

Download: PC: cran.r-project.org/bin/windows/base/ Mac: cran.r-project.org/bin/macosx/

4. Easy example in R

```
> x=c(1:5)                Stores the numbers 1 2 3 4 5 in x
> x                       Shows what is stored in x
> y=x^2                   Calculates the squares of x and stores in y
> plot(x,y)               Plots y vs x
```

5. Learning R

To get familiar with R, work through this excellent free online tutorial: tryr.codeschool.com/