Resources:

To install R, go to https://cran.r-project.org/bin/windows/base/ (Windows) or https://cran.r-project.org/bin/macosx/ (Mac) and follow the instructions.

Below is a selection of the resources that I have come across, but there are many, many more out there if you search around. Do let me know of any others that you have found particularly useful that are not on this list.

Books
Note: PDF copies for several of these are available online if you do a google search. Most are also available from the library.

R Cookbook - Paul Teetor. Basic "recipes" for general data processing and statistical analysis in R. Clear and easy to follow.
R for Data Science – Hadley Wickham. Available for free http://r4ds.had.co.nz/ . Takes you through the basics of how to load, manipulate, analyse and display data. A very nice set of instructions; the down-side is that the author uses a very specific style of writing code. It's very easy to follow once you are used to it, but it doesn't always match what other packages in R use, and therefore it could potentially lead to confusion.
ggplot2: Elegant graphics for data analysis - Hadley Wickham. A guide for the graphics package ggplot2.
R graphics cookbook - Winston Chang. Another graphics guide that's based mainly on ggplot2.
Biostatistical design and analysis using R: a practical guide - Murray Logan. I've not used this one but it comes recommended!
Numerical Ecology with R – Borcard, Gillet and Legendre. Shows you how to implement various statistical techniques that are useful to ecologists and others, including some advanced multivariate methods.
Analysis of Phylogenetics and Evolution with R - Emmanuel Paradis. A guide to the APE package. Quite complex but very useful if you're doing any phylogenetic analysis.
Practical computing for biologists - Haddock and Dunn. Not directly R-related but comes highly recommended for learning about programming in general

Websites

http://www.twotorials.com/ - lots of short, two-minute "how-to" videos about various functions and data types in R, starting with the basics. Very useful if you can keep up with the fairly rapid pace!
http://www.cookbook-r.com/ - NOT the same as the book, but a useful resource in its own right
http://www.ats.ucla.edu/stat/dae/ - examples to help with particular types of statistical analysis
http://www.r-bloggers.com/ - more advanced info, often on specific packages or techniques
http://stackoverflow.com/ - source of help with specific problems. There are thousands of questions on here that you can search through; the responses are usually simple and

practical. It is a great place to search if you are getting a strange error, or you can't figure out how to get a certain command to work. Usually, you will find that someone has already asked your question. [Note that the website covers all programming languages; to search for R-related questions and answers, type [r] in the search box, followed by your query.] If not, you can post your own, and if you put a bit of effort in to writing a clear question with a reproducible example, you will generally get a quick and helpful response. There are some tips here on how to ask a question well: http://stackoverflow.com/help/how-to-ask .

If in doubt, a quick google search will get you the answer more often than not – just search for "R [function name]", "R [thing you're trying to do]" or "R [error message]"!

Software

TinnR https://sourceforge.net/projects/tinn-r/ – a text editor from which you can run R that is a slightly augmented version of the script window in R. Has some useful automatic features like colour-coding text making it easier to spot errors.
R Studio www.rstudio.com – a step up from TinnR, this is similar but also has windows in which you can view your variables and help files, and automatic completion of object and function names. Useful and popular, though a bit more complicated and visually cluttered so not to all tastes.