

PRE-COURSE INSTALLATION STEPS

This 2-day in-person course will require you to bring your own **laptop** to run code and answer questions. **R, RStudio, and MiKTeX will need to be installed on your computer prior to attending the in-person course.** You will also require an internet connection on the days of the course to download files and install packages. Please check with one of the demonstrators to see if WIFI access can be provided.

INSTALLING R

R is a freely available language and environment for statistical computing and graphics which provides a wide variety of statistical and graphical techniques. Installation files and guides to install R can be found for the main three operating systems (windows, macosx, and linux) on the Comprehensive R Archive Network (CRAN) website <https://cran.r-project.org/>. System requirements related to running R version 4.2.1 can be found on the CRAN website. Tablets such as iPads may not be suitable to run R programming. Cloud-based R platforms may restrict the installation of required dependencies.

A rough installation guide is given below:

On Windows:

Go to <https://cran.r-project.org/bin/windows/base/> and download R-4.2.1 for Windows.

A download should begin with the R installer program. When finished downloading, run this program and step through the installation wizard that appears. The wizard will install R into your program files folders and place a shortcut in your Start menu provided you have the appropriate administration privileges to install new software on your machine. If you do not have administration privileges, you can still install R into your personal folders.

On Macosx:

To install R on a Mac, go to <https://cran.r-project.org/bin/macosx/>. Next, click on the 4.2.1 package link. An installer will download to guide you through the installation process, which is very easy. The installer lets you customize your installation, but the defaults will be suitable for most users. In order to compile some R packages on Mac, some additional development tools may be required. Please go to <https://mac.r-project.org/tools/> and check that you have the appropriate development tools (**Xcode** and a **GNU Fortran compiler**) listed installed on your computer.

On Linux:

R comes preinstalled on many Linux systems, but you'll want newest version of R, 4.2.1 if yours is out of date. Go to <https://cran.r-project.org/bin/linux/> and files to build R from source on Debian, Redhat, SUSE, and Ubuntu systems under the link "Download R for Linux" can be found. Click the link and then follow the directory trail to the version of Linux you wish to install on. The exact installation procedure will vary depending on the Linux system you use.

INSTALLING RSTUDIO

The RStudio IDE is a set of integrated tools designed to help you be more productive with R and Python. It includes a console, syntax-highlighting editor that supports direct code execution, and a variety of robust tools for plotting, viewing history, debugging and managing your workspace.

Before installing RStudio, please ensure you have successfully installed R on your computer.

To download the **free** RStudio IDE go to <https://www.rstudio.com/products/rstudio/download/#download> and download the RStudio installer for your operating system. Once downloaded, run the installer wizard and follow the prompts. When completed, open R Studio and ensure it has found your previously installed R version.

INSTALLING MIKTEX

As part of this course we will also cover reproducible research with RMarkdown. In order to fully take advantage of the features of RMarkdown, a LaTeX distribution is required. MiKTeX is a good free one www.miktex.org/download.

- Instructions for installing MiKTeX on Windows can be found at <https://miktex.org/howto/install-miktex>.
- Instructions for installing MiKTeX on MacOSx can be found at <https://miktex.org/howto/install-miktex-mac>.
- Instructions for installing MiKTeX on Linux can be found at <https://miktex.org/howto/install-miktex-unx>.

Alternatively - If you do not have admin privileges on your device, there is an R package called **tinytex** which contains a lightweight TeX distribution that can be installed using R. To install this you will need to open R (or RStudio) and run the following commands in the console.

```
install.packages('tinytex')  
tinytex::install_tinytex()
```