

EEB 603 – Reproducible Science

Additional online resources

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Introduction

The field of reproducible science as implemented in [RStudio](#) is moving very fast and it is hard to keep up with new R packages and tools. The instructor is attempting at providing students with relevant online resources to complement class materials.

Podcast

The challenge of reproducing results from ten-year-old code:

- <https://www.nature.com/articles/d41586-020-02484-1>

Library of open-access books

Please find [here](#) a suite of open-access books written with the R [bookdown package](#), which are relevant to the EEB603 - Reproducible Science course.

R Markdown

Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>. Please find below additional key resources on this topic:

- **R Markdown: The Definitive Guide:** <https://bookdown.org/yihui/rmarkdown/>

Writing books and complex/large documents

R Markdown can be used to produce basic HTML, PDF, and Word documents; however, more complex and larger projects can become difficult to manage in a single R Markdown file. The [bookdown](#) package addresses this limitation, and offers several key improvements:

- Books and reports can be built from multiple R Markdown files.
- Additional formatting features are added, such as cross-referencing, and numbering of figures, equations, and tables.
- Documents can easily be exported in a range of formats suitable for publishing, including PDF, e-books and HTML websites.

A book dedicated to this topic can be accessed [here](#) and the package can be downloaded [here](#).

Notebook

An R Notebook is an R Markdown document with chunks that can be executed independently and interactively, with output visible immediately beneath the input.

You can create a new notebook in RStudio with the menu command `File -> New File -> R Notebook`, or by using the `html_notebook` output type in your document's YAML metadata.

Homework assignments on RPubs

A huge number of homework assignments have been published to the website <https://RPubs.com> (a free publishing platform provided by RStudio), which shows that R Markdown is easy and convenient enough for students to do their homework assignments. As a TA or GA, you might even consider asking your students to complete their homework using R Markdown and publishing them on RPubs!

Journals

Submitting scientific manuscripts written in R Markdown is still challenging; however the R [rticles package](#) was designed to simplify the creation of documents that conform to submission standards for academic journals. The package provides a suite of custom R Markdown LaTeX formats and templates for the following journals/publishers that are relevant to the EEB program:

- Biometrics articles
- Elsevier journal submissions
- Frontiers articles
- MDPI journal submissions
- PeerJ articles
- PNAS articles
- Royal Society Open Science journal submissions
- Sage journal submissions
- Springer journal submissions
- The R Journal articles
- Taylor & Francis articles

Interactive tutorials

The R [learnr package](#) allows to turn R Markdown documents into interactive tutorials. Tutorials consist of content along with interactive components for checking and reinforcing understanding. Tutorials can include any or all of the following:

- Narrative, figures, illustrations, and equations.
- Code exercises (R code chunks that users can edit and execute directly).
- Quiz questions.
- Videos (currently supported services include YouTube and Vimeo).
- Interactive Shiny components.

Please see the full documentation (with examples) at this url: <https://rstudio.github.io/learnr/>