Resources

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This page collects learning resources for scientific computing. Several chapters keep their own resource lists, so this page points to those lists rather than repeating them:

- R Coding Practices: Additional Resources - books on R, R packages, Shiny, and Git for R users
- R Coding Practices: Tidyverse - tidy evaluation, programming with `{dplyr}`, and a skeptical view
- Continuous Integration - CI services and tools for R packages
- Quarto - Quarto documentation, templates, and `{litedown}`
- Git and GitHub - GitHub Learn, the UC Davis DataLab Git sandbox, and graphical Git clients
- Unix - shell tools and The Missing CS Quarter at UC Davis

Resources for R

- Awesome R Package Development Tools - curated list of tools for R package development
- Tidyverse style guide - the style guide behind R Code Style
- Tidyverse Skeptic - Norm Matloff's essay arguing that beginners should learn base R before the Tidyverse (source; summarized in A Skeptical View)
- Hadley Wickham's R Style Guide - the style chapter of the first edition of *Advanced R*
- Tidyverse data-dict - open specification and CLI tool for creating, validating, and documenting data dictionaries in YAML format

UC Davis DataLab workshops and tutorials

The UC Davis DataLab provides workshops and learning materials for data science:

- Workshop Index - catalog of all DataLab workshops
- R Basics Workshop - foundational R programming for beginners
- Research Toolkits - guides for research tools and methods

- Install Guides - setup instructions for data science software

Cheat sheets

- Data transformation with dplyr cheat sheet
- Data tidying with tidyr cheat sheet
- Data visualization with ggplot2 cheat sheet
- data.table cheat sheet
- R Markdown cheat sheet

Resources for Git and GitHub

- GitHub Skills: Introduction to GitHub - an interactive exercise, under an hour long, on branches, commits, and pull requests

Resources for Python

- UC Davis DataLab Python Basics Workshop - foundational Python programming
- Natural Language Processing with Python - text analysis and NLP techniques
- Jupyter Notebooks in a Git Repository - guide by Matthias Geier on managing Jupyter notebooks in Git repositories, including workflows for stripping cell outputs before committing and strategies for sharing executed notebooks

Resources for Julia

- UC Davis Julia Users Group Julia Basics Workshop - foundational Julia programming

Open science and reproducibility

- The Open Science Manual - an open-source guide from the ARCA group at the University of Padova covering programming good practices, version control, and reproducible workflow tools.
- Openscapes - an open science mentorship and community initiative founded by Dr. Julia Stewart Lowndes, focused on helping research groups transition to data-intensive, reproducible, and collaborative scientific practices through cohort-based Champions programs and shared open tooling.

Source

Adapted from the Resources chapter of the UCD-SERG lab manual, whose R resource lists began in the Benjamin-Chung Lab Manual by Jade Benjamin-Chung and Kunal Mishra.