

# R Markdown

## Course outline

### **Module 1: Introduction to R Markdown**

Module 1: Introduction to R Markdown is an introductory course designed to teach students the basics of R Markdown. This module covers topics such as creating and formatting documents, adding images and tables, and using code chunks. It also provides an overview of the different types of R Markdown documents and how to use them. By the end of this module, students will have a solid understanding of the fundamentals of R Markdown and be able to create their own documents.

#### ***Lessons***

- Overview of R Markdown
- Creating a Basic R Markdown Document
- Formatting Text and Headings
- Adding Images and Tables
- Adding Code Chunks and Output
- Customizing Output with HTML and CSS
- Publishing and Sharing Your Work
- Troubleshooting Common Issues

#### **After completing this module, students will be able to:**

- Understand the basics of R Markdown and how to create documents using it.
- Learn how to format text, add images, and create tables and lists in R Markdown documents.
- Be able to create interactive documents with R Markdown and knitr.
- Be able to publish R Markdown documents to the web.

### **Module 2: Writing Reports with R Markdown**

Module 2 of the R Markdown course focuses on teaching students how to create professional reports using the R Markdown language. Students will learn how to create tables, figures, and equations, as well as how to format and style their reports. Additionally, students will learn how to use the knitr package to generate HTML, PDF, and Word documents from their R Markdown code.

#### ***Lessons***

- Introduction to R Markdown
- Creating Reports with R Markdown
- Formatting Reports with R Markdown

- Adding Visualizations to Reports with R Markdown
- Publishing Reports with R Markdown
- Customizing Reports with R Markdown
- Troubleshooting Reports with R Markdown
- Advanced Topics in R Markdown Reports
- Best Practices for Writing Reports with R Markdown

### **After completing this module, students will be able to:**

- Create professional-looking reports in R Markdown using formatting, images, and tables.
- Utilize the knitr package to generate HTML, PDF, and Word documents from R Markdown.
- Incorporate R code into reports to generate dynamic content.
- Publish reports to the web using R Markdown and the RStudio Connect platform.

## **Module 3: Creating Presentations with R Markdown**

Module 3 of the R Markdown course focuses on creating presentations with R Markdown. This module covers topics such as creating slides, formatting slides, adding images and videos, and creating interactive slides. It also covers how to customize the look and feel of your presentation, as well as how to publish and share your presentation.

### ***Lessons***

- Introduction to R Markdown
- Writing R Markdown Documents
- Formatting R Markdown Documents
- Adding Visualizations to R Markdown Documents
- Creating Interactive Documents with R Markdown
- Publishing R Markdown Documents
- Troubleshooting Common Issues with R Markdown
- Advanced Topics in R Markdown
- Creating Presentations with R Markdown
- . Customizing R Markdown Presentations
- . Adding Animations and Interactivity to R Markdown Presentations
- . Publishing R Markdown Presentations
- . Troubleshooting Common Issues with R Markdown Presentations

### **After completing this module, students will be able to:**

- Create a presentation in R Markdown using the RStudio IDE.
- Utilize the knitr package to generate HTML, PDF, and Word documents from R Markdown.
- Incorporate images, tables, and equations into a presentation.
- Customize the appearance of a presentation using themes and formatting options.

## **Module 4: Customizing R Markdown Outputs**

Module 4 of the R Markdown course focuses on customizing R Markdown outputs. It covers topics such as creating custom HTML and PDF documents, customizing the appearance of documents, and using templates to create consistent documents. It also covers how to use the knitr package to create dynamic documents. This module will help you create professional-looking documents with R Markdown.

## ***Lessons***

- Introduction to Customizing R Markdown Outputs
- Understanding the YAML Header
- Customizing HTML Outputs
- Customizing PDF Outputs
- Customizing Word Outputs
- Customizing PowerPoint Outputs
- Customizing LaTeX Outputs
- Customizing Shiny Outputs
- Troubleshooting Customization Issues
- . Advanced Customization Techniques

## **After completing this module, students will be able to:**

- Understand the different types of output formats available in R Markdown.
- Create custom templates for R Markdown documents.
- Utilize the knitr package to customize the output of R Markdown documents.
- Use the YAML header to customize the output of R Markdown documents.

## **Module 5: Working with R Markdown Templates**

Module 5 of the R Markdown course focuses on working with R Markdown templates. It covers topics such as creating custom templates, using existing templates, and customizing existing templates. It also covers how to use the R Markdown package to create documents with a consistent look and feel. Finally, it covers how to use the knitr package to create dynamic documents.

## ***Lessons***

- Introduction to R Markdown Templates
- Creating Custom R Markdown Templates
- Using R Markdown Templates for Reports
- Using R Markdown Templates for Presentations
- Using R Markdown Templates for Websites
- Troubleshooting R Markdown Templates
- Advanced Features of R Markdown Templates
- Best Practices for Working with R Markdown Templates
- Tips and Tricks for Working with R Markdown Templates
- . Integrating R Markdown Templates with Other Tools

## **After completing this module, students will be able to:**

- Create and customize R Markdown documents with different templates.
- Understand the structure of an R Markdown document and how to use it to create reproducible reports.
- Utilize the knitr package to generate HTML, PDF, and Word documents from R Markdown documents.
- Incorporate images, tables, and equations into R Markdown documents.

## Module 6: Troubleshooting R Markdown

Module 6 of the R Markdown course focuses on troubleshooting common issues that may arise when creating R Markdown documents. It covers topics such as debugging code, resolving errors, and formatting documents. It also provides tips and tricks for making the most of R Markdown.

### **Lessons**

- Identifying and Resolving Common Errors in R Markdown
- Debugging R Markdown Code
- Troubleshooting R Markdown Output
- Resolving Issues with R Markdown Syntax
- Fixing Issues with R Markdown Formatting
- Troubleshooting R Markdown Packages
- Debugging R Markdown Chunks
- Resolving Issues with R Markdown Tables
- Troubleshooting R Markdown Graphics
- . Fixing Issues with R Markdown Links

### **After completing this module, students will be able to:**

- Understand the basics of troubleshooting R Markdown documents.
- Identify and resolve common errors in R Markdown documents.
- Utilize debugging techniques to identify and fix errors in R Markdown documents.
- Create and modify R Markdown documents with confidence.

## Module 7: Advanced Topics in R Markdown

Module 7: Advanced Topics in R Markdown is a course designed to help students learn more advanced techniques for creating documents with R Markdown. This module covers topics such as creating custom templates, using LaTeX for equations, and creating interactive documents with Shiny. Students will also learn how to use R Markdown to create presentations, websites, and books.

### **Lessons**

- Creating Customized HTML Outputs with R Markdown
- Advanced Formatting with R Markdown
- Creating Interactive Documents with R Markdown
- Creating Dashboards with R Markdown

- Creating Reports with R Markdown
- Creating Presentations with R Markdown
- Creating Books with R Markdown
- Creating Websites with R Markdown
- Creating Blogs with R Markdown
- . Creating Interactive Applications with R Markdown

### **After completing this module, students will be able to:**

- Create complex documents with multiple sections, figures, and tables.
- Utilize advanced features of R Markdown such as parameterized reports, dynamic documents, and interactive documents.
- Incorporate external data sources into R Markdown documents.
- Publish R Markdown documents to the web or other formats such as PDF, Word, and HTML.

## **Module 8: Publishing R Markdown Documents**

Module 8 of the R Markdown course covers the basics of publishing R Markdown documents. It covers topics such as creating HTML, PDF, and Word documents, as well as how to customize the output of your documents. Additionally, it covers how to use the knitr package to create dynamic documents and how to use the rmarkdown package to create interactive documents.

### ***Lessons***

- Introduction to R Markdown
- Writing R Markdown Documents
- Formatting R Markdown Documents
- Adding Visualizations to R Markdown Documents
- Publishing R Markdown Documents
- Customizing R Markdown Documents
- Troubleshooting R Markdown Documents
- Advanced Topics in R Markdown Documents

### **After completing this module, students will be able to:**

- Create and publish R Markdown documents with embedded R code.
- Utilize the knitr package to create dynamic documents.
- Format documents with HTML, PDF, and Word output formats.
- Use the R Markdown syntax to customize the appearance of documents.