R-SHINY: POWERFUL WEB APPS FOR EVERYONE

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
R-Shiny: Powerful Web Apps for Everyone	2	0	0	2	Class XII	NIL

Learning Objectives: The objective of this course is to:

- Build interactive web applications for charts, tables, graphs, and maps using R Shiny.
- Create, develop, and deploy Shiny web applications using reactive components.
- Customize the appearance of Shiny web apps using Shiny in R Markdown.

Learning Outcomes: After completion of the course the learner will be able to:

- Understand the fundamentals of Shiny and develop interactive web applications.
- Understand reactive programming concepts and building reactive web applications.
- Learn R Markdown and deploy Shiny apps locally and to the web with flexdashboard.

UNIT-I: Introduction to Shiny and Basic User Interface (UI) components (20 hours)

What is Shiny? How Shiny works with R; Create Shiny app directory and file, Adding UI controls, and behaviour; Building the UI using the fluidPage(), Input, and Output functions, and deploy Shiny apps locally using server function.

UNIT-II: Reactive Programming in Shiny (20 hours)

Basic reactivity: The server function and creating reactive outputs using Shiny's render functions, Reactive programming, Reactive graph, and reactive expressions.

UNIT-III: Shiny in R Markdown (20 hours)

R Markdown: Installation, Basics**,** Shiny with flexdashboard**,** Building Shiny documents by adding the option 'runtime: shiny' to the YAML metadata; Deploy Shiny apps to the web, Embedded Shiny apps, and Shiny widgets.

Essential Readings

1. Wickham, Hadley (2021). Mastering Shiny: Building Interactive Apps, Reports, and Dashboards Powered by R. O'Reilly Media. (https://mastering-shiny.org/)
2. https://shiny.rstudio.com/tutorial/
3. Xie, Yihui, Allaire, J.J, & Grolemund, Garrett (2019). R Markdown: The Definitive Guide. CRC Press, Taylor & Francis Group. (https://bookdown.org/yihui/rmarkdown/)

Suggested Reading

- Granjon, David (2022). Outstanding User Interfaces with Shiny. CRC Press.

Practical Exercises: Practice exercises from first three chapters of Hadley's Mastering Shiny.

Teaching Plan (SEC Paper: R-Shiny: Powerful Web Apps for Everyone)

Weeks 1, and 2: What is Shiny? How Shiny works with R; Create Shiny app directory and file, Adding UI controls, and behaviour. **[1]**: Preface, and Chapter 1.
[2]: Welcome to Shiny: **Lesson1**, and **getting started**
Weeks 3 to 5: Basic UI: Building the UI using the fluidPage(), Input, and Output functions, and deploy Shiny apps locally using server function. [1]: Chapter 2
[2]: Build a UI and control widgets: **Lesson2**, and **Lesson3**
[2]: **User Interface and server function**
Weeks 6 to 8: Basic reactivity: The server function and creating reactive outputs using Shiny's render functions. [1]: Chapter 3 (pages 27-30); [2]: Reactive output: **Lesson4**
[2]: **Reactive Flow**, and **Reactive Elements**
Weeks 9, and 10: Reactive programming, Reactive graph, and reactive expressions.
[1]: Chapter 3 (pages 30-35).
[2]: Reactive expressions: **Lesson6**
Weeks 11, and 12: R Markdown: Installation, Basics, Shiny with flexdashboard.
[3]: Chapter 1, Chapter 2 (p. 5-8, and section 2.8.2, p. 42-45), Chapter 5 (Section 5.3, p. 131-135).
Weeks 13 to 15: Building Shiny documents by adding the option 'runtime: shiny' to the YAML metadata; Deploy Shiny apps to the web, Embedded Shiny apps, and Shiny widgets.
[3]: Chapter 19 (Sections 19.1 to 19.4, pages 283-293); [2]: Share Shiny Apps: **Lesson7**