Course Module: Basic R Programming

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Class	Module Title	Topics Covered
1	Introduction to R and RStudio	- Overview of R and its uses
		- Installing R and RStudio
		- RStudio interface walkthrough
		- Scripts and console
		- Basic arithmetic in R
		- Hands-on Activity
2	Data Types and Structures in R	- Atomic data types: numeric, character, logical
		- Vectors and lists
		- Factors
		- Matrices
		- Data frames vs. tibbles
		- Hands-on Activity
3	Data Import and Export	- Reading CSV, Excel, and TXT files
		- File paths and working directories
		- readr, readxl
		- Hands-on Activity
4	Data Manipulation with dplyr	- Filtering and selecting data
		- Creating new columns with mutate()
		- Sorting with arrange()
		- Grouping with group_by() and summarise()
		- Hands-on Activity
5	Data Cleaning and Preprocessing	- Handling missing values (NA)
		- Converting data types
		- Renaming and recoding
		- Reshaping data with tidyr
		- Hands-on Activity
6	Data Visualization with ggplot2	- Basic plot types: scatter, line, bar, histogram
		- Customizing plots (titles, labels, themes)
		- Color and faceting
		- Publication-Quality Visualizations
		- Hands-on Activity
7	Basic Statistical Analysis	- Descriptive statistics
		- Correlation and covariance
		- T-tests and one-way ANOVA
		- Simple linear regression with lm()
		- Hands-on Activity
8	Working with Dates and Time (lubridate)	- Parsing dates
		- Extracting date components

		- Date arithmetic
		- Grouping by time (e.g., monthly summaries)
		- Hands-on Activity
Optional	Bonus Topics	- Introduction to R Markdown for reporting
		- Hands-on Activity