

DTI-STU-105

R Programming

Program Information



Nature of the Course
Theory + Practical



Total Hours per Day
2 hours



Course Duration
30 days

Course Summary

The R course at the Deerwalk Training Center offers a comprehensive set of software tools for data processing, calculation, and graphical display. It consists of the following components: an efficient data handling and storage facility, a set of operators for working with arrays, particularly matrices. This course covers a well-developed, simple, and effective programming language with conditionals, loops, user-defined recursive functions, and input and output facilities.

Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the Module:

- Has attended 90% of all classes held
- Has received an average grade of 80% on all assignments
- Has received an average of 60% in assessments
- The tutor believes the student has grasped all of the concepts and is ready to go on to the second module.

Required Textbooks

- Andrie de Vries and Joris Meys, "R for Dummies", Wiley.
- Jum Albert and Maria Rizzo, "R by Example", Springer Media
- Michael J. Crawley, "The R Book", Wiley.

Prerequisites

There are no specific prerequisites for learning R.

- If you want to utilize R for a variety of analytical tasks, you'll need to have a basic understanding of statistics.
- However, to get started with R as a programming language, you don't need to know any of the other programming languages.

Course Details



Week 1

Lesson 1

Introduction To R Programming

- R and R-Studio
 - Simple expressions
 - Assignments
 - Functions
 - Getting help in R
 - Factors
 - Data frames
 - Vectors and indexing vectors
 - Vectorized expressions
 - Comments
 - Dealing with missing values
 - Using R packages
 - Coding and naming conventions
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Week 2 and 3

Lesson 1

Data Manipulation

- Data already in R
 - Reviewing data
 - Reading data
 - Writing data
 - Manipulating data with dplyr package
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Lesson 2

Visualizing data

- Quickly exploring data
 - Scatter plot
 - Line graph
 - Bar graph
 - Histogram
 - Box plot
 - The Grammar of Graphics and the ggplot2 package
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Week 2 and 3

Lesson 3

More on R programming

- Expressions
 - Basic data types
 - Data structures
 - Control structures
 - Grouped expressions
 - Conditional execution: if statements
 - Repetitive execution: for loops, repeat & while
 - Functions
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Week 4

Lesson 1

Statistical functions

- Measures of central tendency
 - Correlation
 - T-test
 - Regression
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Lesson 2

Reproducible Analysis

- R Markdown/Knitr document
 - The YAML language
 - The markdown language
 - Running R code in markdown documents
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Labs

Lab assignments will focus on the practice and mastery of contents covered in the lectures; and introduce critical and fundamental problem-solving techniques to the students.

Learning Outcomes

- Import, examine, manipulate, and summarize data sets in R
- Explore data sets to develop testable hypotheses and find applicable statistical tests
- Use R to do relevant statistical tests Create and edit visualizations with R
- Learn the fundamentals of R programming, including constructions, control statements, and string functions
- Identify the key terminologies, concepts, and techniques used in statistical analysis.
- Learn how to use R programming for text processing
- Able to understand and implement R programming from a statistical standpoint.

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