

## R Programming for Business Analytics

### 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 Programming for Business Analytics	2	0	0	2	XII pass	NIL

### Learning Objectives

- To introduce the basic concepts in R programming.
- To equip the students with the popular statistical programming language R.
- To familiarize the students with utility of 'R' for managerial decision making.

### Learning outcomes

Upon successful completion of this course the student will be able to:

- Learn Syntax and Semantics of R Programming
- Understand the file system and data handling in R.
- Visualize and analyse the data using statistical methods.
- Apply best practice model design methodologies to real problems using R

### SYLLABUS

#### Unit I: Introduction to R, Data Handling and Data Visualization (16 hours)

Introduction to R and familiarization of R Studio, Basic components in R Studio. R Syntax and programming, Understanding *tidyverse*, *tibble*, *dplyr*, *ggplot2*, *tidyr*, *purrr*, *readr*, *forcats*, *stringr* for tidying, manipulating and plotting data,

#### Unit II: Optimization Models using R (12 hours)

Linear Programming Models, Optimization models, understanding *optim()*,

#### Unit III: Machine Learning with R - Introduction to Supervised Learning

(16 hours)

Classification based on similarities with k-nearest neighbours, odds with logistic regression, maximizing separation with discriminant analysis, classifying with decision trees, regression with kNN, random forest, XGBoost, Understanding *mlr*, *classif.*, *regr.*

#### **Unit IV: Machine Learning with R - Introduction to Unsupervised Learning (16 hours)**

Dimension Reduction- Maximizing variance with Principal Component Analysis; k-mean cluster, understanding *cluster*. .

##### **Essential/recommended readings**

- Boehmke, B. & Brandon, G.(2020). Hands-on Machine Learning with R, CRC Press.
- Horton, N.J. & Kleinman, K.(2015) Using R & R Studio for Data Management, Statistical Analysis, and Graphics, CRC Press.
- Peng, R. D. (2016). *R programming for data science* (pp. 86-181). Victoria, BC, Canada: Leanpub.
- Lander, J. P. (2014). *R for everyone: Advanced analytics and graphics*. Pearson Education.
- Teetor, P. (2011). *R cookbook: Proven recipes for data analysis, statistics, and graphics*. " O'Reilly Media, Inc."
- Zhao, Y., & Cen, Y. (2013). *Data mining applications with R*. Academic Press.

**Note: Learners are advised to use the latest edition of readings.**

##### **Examination scheme and mode:**

Evaluation scheme and mode will be as per the guidelines notified by the University of Delhi.