



# Jansons Institute of Technology

Karumathampatti, Coimbatore – 641 659  
Approved by AICTE and Affiliated to Anna University  
An ISO 9001:2015 certified institution

## Industry Readiness Course - Syllabus Department of Computer Science and Engineering Data Analysis & Visualization in R 2021- 2022 ODDSemester

### Learning Objectives

The objective of this module to make students exercise the fundamentals of statistical analysis in R environment.

They would be able to analysis data for the purpose of exploration using Descriptive and Inferential Statistics. Students will understand Probability and Sampling Distributions and learn the creative application of Linear Regression in multivariate context for predictive purpose.

### Learning Outcomes

After the successful completion of this module, students will be able to:

- Install, Code and Use R Programming Language in R Studio IDE to perform basic tasks on Vectors, Matrices and Data frames.
- Describe key terminologies, concepts and techniques employed in Data Analysis.
- Define, Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.
- Conduct and Interpret a variety of Hypothesis Tests to aid Decision Making.
- Understand, Analyse, Interpret Correlation and Regression to analyse the underlying relationships between different variables

### Module 1:

#### Overview of Data Analytics and R Programming

Introduction to Data Analytics - Data Analytics Model - Data Analytics Methods – Classification – Regression – Decision Trees - Clustering - Frequent Patterns - Introduction to R and RStudio - R tools and their uses in Business Analytics - Data Frame and write file.

### Module 2:

#### Data Manipulation in R

Data cleaning - Data inspection - Use of functions `grep()` - `grepI()` - `sub()` - `apply()` -Data import techniques - csv files, spreadsheets and text files -Data Wrangling - Understanding the Exploratory Data Analysis(EDA) - Implementation of EDA on various datasets.

### Module 3:

#### Data Visualization in R

Understanding on Data visualization: Basic principles - categorical and continuous variables -Graphical functions present in R - Plot various graphs -tableplot – Histogram - Box Plot - Customizing Graphical Parameters to improvise the plots - Exploratory graphical analysis - Creating static graphs, animated visualizations.

### Books and references

1. Hastie, T., Tibshirani, R.,, Friedman, J. (2009). The elements of statistical learning: data mining, inference and prediction. Springer. Textbook.
2. Richard O. Duda, Peter E. Hart, and David G. Stork. 2000. Pattern Classification (2nd Edition). Wiley-Interscience, New York, NY, USA.



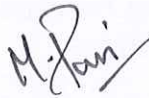
  
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3. Christopher M. Bishop. 2006. Pattern Recognition and Machine Learning (Information Science and Statistics). Springer-Verlag, Berlin, Heidelberg.
4. Teetor, P. (2011). R cookbook. Sebastopol, CA: O'Reilly. ISBN 9780596809157.
5. Chang, W. (2013). R graphics cookbook. Sebastopol, CA: O'Reilly. ISBN 9781449316952.
6. Andy Field, Jeremy Miles and Zoe Field. (2012) Discovering Statistics Using R. Publisher: SAGE Publications Ltd. ISBN-13: 978-1446200469.
7. Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani. (2013) An Introduction to Statistical Learning with Applications in R. Springer.
8. <https://www.openintro.org/stat/> Free PDF for download & R tutorials and codes.

**Course Designed By**



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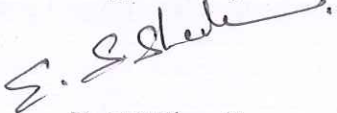


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