

FINANCIAL DATABASE AND ANALYSIS SOFTWARE

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		
Financial Database and Analysis Software	2	0	0	2	Class XII	NIL

Learning Objectives

The Learning Objectives of this course are as follows:

- To enable students to obtain data from financial database.
- To enable to use R language for statistical & econometric data analysis.
- To develop skills that can help in solving your research problems.

Learning outcomes

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to understand the utility of a financial database
- After studying this course, students will be able to extract data from financial database (Prowess IQ)
- After studying this course, students will be able to perform data analysis using R
- After studying this course, students will be able to apply 'R' and ProwessIQ in financial analysis and research.

SYLLABUS

Unit I (Financial Database)

(12 hours)

An Introduction to financial database ProwessIQ from CMIE: Creating company set-, creating spreadsheets, use of elements in Ribbons – Company address and identity indicators, business segments and products, Ownership structure and governance indicators, Financial Statements, Stock prices and capital changes, Capex and M&A, indices and index number. Formulating queries and advance queries Student is expected to be able to extract different types of data for an index, an industry and company data Selection of company/s, period to be studied. Data extraction from balance sheet, profit & loss statement and cash flow statements Stock market data- price and volume, BSE/NSE, adjusted prices Saving and exporting data to a spreadsheet

for further analysis.

Unit II (Fundamentals of R)

(16 hours)

Overview of the R language, Input and output of data in R, Help command and Directory in R, In-built functions in R, Operators in R; Assignment, Arithmetic, logical, and Relational operators, Using R studio, Scripts, Text editors for R, Graphical User Interfaces (GUIs) for R, installing packages and libraries, Variable classes (numeric, character, logical, complex, missing), Data Types in R; Vectors, Matrices, Arrays, Lists, Factors, and Data Frames, Important operations of these Data Types, Using data from external files- reading & writing data to external files, Creating and storing R workspaces.

Unit III (Descriptive Analysis and Data Visualizations)

(16 hours)

Data preparation; Data cleaning and Missing value treatment, Data Exploration and Manipulation, Data Visualization; Bar chart, pie chart, Histogram, Frequency curve, Scatter plot, Box & Whisker plot etc., Important R functions for Describing a data; Mean, Median, Range, Standard deviation, Variance, Five number summary, Correlation coefficients for a bivariate data.

Unit IV (Predictive Analysis)

(16 hours)

Simple and Multiple Regression using R, Estimating Regression Equation by Ordinary Least Squares in R, Violations of Classical Assumptions: multicollinearity, heteroscedasticity, autocorrelation and model specification errors, their identification, their impact on parameters; tests related to parameters and impact on the reliability and the validity of inferences in case of violations of Assumptions; methods to take care of violations of assumptions, goodness of fit. Time Series Analysis using R (Basic idea only).

Essential/recommended readings

- Gardener, M., *Beginning R: The Statistical Programming Language*, Wiley & Sons. 2018
- Wickham, H., et al. *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data*, O'Reilly, 2017
- Motwani, B., *Data Analytics with R*, Wiley & Sons, Indian edition 2021
- Chang, R *Graphics Cookbook- Practical Recipes for Visualizing Data*; O' Reilly Media
- Gujarati, D.N. et al. *Basic Econometrics*, McGraw Hill India, 5e, 2018

Useful web links

- <https://prowessiq.cmie.com>
- CRAN website: <https://cran.r-project.org/>
- <https://rstudio.com/products/rstudio/download/> (R studio)
- <http://r-statistics.co>

Examination scheme and mode:

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