![Marwadi University]

PROGRAM	Master of Business Administration – Business Analytics
SEMESTER	I
COURSE TITLE	Introduction to RStudio
COURSE CODE	04MB1113
COURSE CREDITS	2
COURSE DURATION	28 Hrs (28 sessions of 60 minutes each)

COURSE OUTCOMES:

● Combine various tools and packages of R programming language for business analytics.
● Select the right functions and control structure of R Programming language.
● Analyze data graphically by creating various plots using visualization tools in R.

COURSE CONTENTS:

Unit No	Unit / Sub Unit	Sessions
I	**Introduction to R –** Introduction, Downloading and installing R, IDE and Text Editors, handling packages in R **Getting Started with R** – Working with Directory, Data Types in R, Commands for Data Exploration **Loading and Handling Data** – Assigning Objects, Expression, Variables, Functions, Missing Values, Vectors, Matrices, Factors, Lists, subsetting a vector, subsetting a matrix, Common analytical tasks, grouping variables, Methods of Reading and Writing data in R **Exploring Data in R –** Data Frames, Functions on Data Frame, Load Data Frames **Managing Data Frames with the *dplyr* package** – Data Frames, The dplyr Package, dplyr Grammar, Installing the dplyr package, select (), filter (), arrange (), rename () , mutate() function.	10
II	**Control Structures:** if-else loops, for Loops, while Loops, next, break **Functions and Loop Functions:** **Functions:** Functions in R, Your First Function, *Argument Matching*, Lazy Evaluation, The ... Argument, Arguments Coming After the ... Argument, Functions using control statements **Loop Functions:** Looping on the Command Line, lapply(), sapply(), split(), Splitting a Data Frame, tapply, apply(), Col/Row Sums and Means, Other Ways to Apply, mapply()	8
III	**Descriptive Statistics**: Basic Arithmetic Operations, **Standard Functions** like abs(), sqrt(), round(), sum(), product(), log(), log10(), **Statistical Functions** like min(), max(), range(), mean(), quantile(), summary(), var(), sd(), scale(), boxplot(), cov(), cor() **Frequency Measures and Graphical Presentation** frequency distribution and cumulative frequency distribution tables, Bar Chart, Pie Chart, Histogram, Box-Whisker Plot, Scatterplots **Simulation:** Generating Random Numbers, Setting the random number seed, Simulating Random Sampling, R function for solution of Binomial, Poisson, Normal and Exponential distribution problems **Hypothesis Testing**: Testing Means (Single mean and Two Means)	10

EVALUATION:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

	Component	Weightage
A	Continuous Evaluation Component (Assignments / Quizzes /Class Participation etc.)	20% (C.E.C.)
B	Internal Assessment (Lab based Practical Examination using R-software)	30% (I.A.)
C	End-Semester Practical Examination	50% (Practical/VIVA)

SUGGESTED READINGS:

Textbooks:

Sr. No	Author/s	Name of the Book	Publisher	Edition & Year
T-01	Roger D. Peng	R Programming for Data Science	Lean Publishing	1st Edition, 2015
T-02	Nicholas J Horton	Using R and RStudio for Data Management, Statistical Analysis and Graphs	CRC Press – T&F Group	2015
T-03	Christian Heumann, Michael Schomaker, Shalabh Sinha	Introduction to Statistics and Data Analytics: With Exercise, Solutions and Applications in R	Springer	2016

Reference Books:

Sr. No	Author/s	Name of the Book	Publisher	Edition & Year
R-01	Roger D. Peng	Exploratory Data Analysis with R	Lean Publishing	1st Edition, 2015
R-02	Alain F Zuur, Elena Leno	A Beginner's Guide to R	Springer (Use R!)	1st Edition 2009
R-03	A. Ohri	R for Business Analytics	Springer	1st Edition, 2012
R-04	Seema Acharya	Data Analysis using R	McGraw Hill Education	2018