GUJARAT TECHNOLOGICAL UNIVERSITY
Master in Computer Application (Integrated MCA)
Year IV – (Semester-VIII) (W.E.F. December 2016)

Subject Name: Data Analytics with R Programming
Subject Code: 4480602

1. **Learning Objectives:**

   In this course students will learn R. Programming language, data analytics, data visualisation and statistical model for data analytics. By completion of this course, students will be able to become data analyst.

2. **Prerequisites:** Any programming language

3. **Course Contents:**

Unit No.	Course Content	Weightage	No of Lectures
1	**Introduction to Data Analysis** Overview of Data Analytics, Need of Data Analytics, Nature of Data, Classification of Data: Structured, Semi-Structured, Unstructured, Characteristics of Data, Applications of Data Analytics.	15%	5
2	**R Programming Basics** Overview of R programming, Environment setup with R Studio, R Commands, Variables and Data Types, Control Structures, Array, Matrix, Vectors, Factors, Functions, R packages.	25%	8
3	**Data Visualization using R** **Reading and getting data into R (External Data):** Using CSV files, XML files, Web Data, JSON files, Databases, Excel files. **Working with R Charts and Graphs:** Histograms,Boxplots,Bar Charts, Line Graphs, Scatterplots, Pie Charts	25%	11
4	**Statistics with R** Random Forest, Decision Tree, Normal and Binomial distributions,Time Series Analysis,Linear and Multiple Regression, Logistic Regression, Survival Analysis	25%	10
5	**Prescriptive Analytics**	10%	4

Creating data for analytics through designed experiments, Creating data for analytics through active learning, Creating data for analytics through reinforcement learning		

4. Text Book:

1. An Introduction to R, Notes on R: A Programming Environment for Data Analysis and Graphics. W. N. Venables, D.M. Smith and the R Development Core Team. Version 3.0.1 (2013-05-16). URL: https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf

5. Reference Books:

1. Jared P Lander, R for everyone: advanced analytics and graphics, Pearson Education, 2013
2. Dunlop, Dorothy D., and Ajit C. Tamhane. Statistics and data analysis: from elementary to intermediate. Prentice Hall, 2000.
3. G Casella and R.L. Berger, Statistical Inference, Thomson Learning 2002.
4. P. Dalgaard. Introductory Statistics with R, 2nd Edition. (Springer 2008)
5. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer
6. Hastie, Trevor, et al.The elements of statistical learning.Vol. 2. No. 1. New York: springer, 2009.
7. Montgomery, Douglas C., and George C. Runger.Appliedstatistics and probability for engineers. John Wiley &Sons, 2010
8. Joseph F Hair, William C Black etal , "Multivariate Data Analysis" , Pearson Education, 7th edition, 2013.
9. Mark Gardener, "Beginning R - The Statistical Programming Language", John Wiley & Sons, Inc., 2012.
10. W. N. Venables, D. M. Smith and the R Core Team, "An Introduction to R", 2013.

6. Accomplishments of the student after completing the course:

- Ability to apply statistical techniques using R Programming for data analytics and decision making.
- By completion of this course, students will be able to become data analyst.

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