TCET/FRM/IP-02/09 Revision: A

Bridge Course Plan

Semester: VII **Course: IT**

Subject: Data Science and Visualization using R	**2 Lectures / Week**		**Class: BE IT**

Sr. No.	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1.	**Module 1**	L 1.1	• History • Downloading and Installing R • Getting Help on a function • Viewing Documentation • General issues in R • Packages Management • Features • Basics in R • Data Types • Variables • Operators	Power point presentation, Chalk & Board	18-7-17	1.2, 2.1	
2.		L 1.2	• Strings • Vectors • Lists • Matrices • Arrays • Factors	Power point presentation, Chalk & Board	19-7-17	1.2, 2.1	
3.	**Module 2**	L 2.1	• Data Frames • Decision Making • Loops	Power point presentation, Chalk & Board	25-7-17	1.2	
4.		L 2.2	• Functions • Packages • Data Reshaping	Power point presentation, Chalk & Board	27-7-17	1.2	
5.		L 3.1	• Data Types • Sub setting • Writing data • Reading tabular data files • Reading from CSV Files, Excel Files, Binary Files	Power point presentation, Chalk & Board	01-8-17	1.1	
6.	**Module 3**	L 3.2	• Reading from XML Files, JSON Files • Web Data • Database	Power point presentation, Chalk & Board	03-8-17	1.1	
7.		L 4.1	• Creating a vector and vector operations • Initializing a data frame	Power point presentation, Chalk & Board	08-8-17	1.1	

			• Control structures • Selecting data frame cols by position and name • Changing directories Re-directing R output				
8.		L 4.2	• Need for data visualization • Data visualization Components • Creating a Pie Charts, Bar Charts, Boxplots	Power point presentation, Chalk & Board	10-8-17	1.1, 2.1	
9.		L 5.1	• Creating a Histograms, Line Graphs, Scatterplots • Utility and limitations • Introduction to grammar of graphics • Using the ggplot2 package in R to create visualizations	Power point presentation, Chalk & Board	15-8-17	1.2	
10.	**Module 4**	L 5.2	• Appending data to a vector • Combining multiple vectors • List management • Merging data frames • Data transformation • Strings and dates • Outlier detection • Handling NAs and Missing Values • Matrices and Arrays	Power point presentation, Chalk & Board	17-8-17	1.2, 2.1	
11.		L 6.1	• Logical operations • Relational operators • Accessing Variables • Matrix Multiplication and Inversion • Managing Subset of data • Character manipulation • Data aggregation • Subscripting	Power point presentation, Chalk & Board	05-9-17	1.2	
12.	**Module 5**	L 6.2	• Basics of SQL • RODBC and DBI Package • Performing queries • Advanced Data Handling • Combining and restructuring data frames	Power point presentation, Chalk & Board	06-9-17	1.2, 2.1	
13.		L 7.1	• Mean, Median & Mode • Linear Regression • Multiple Regression • Logistic Regression	Power point presentation, Chalk & Board	12-9-17	1.2	
14.		L 7.2	• Normal Distribution • Binomial Distribution	Power point presentation,	13-9-17	1.2, 2.1	

			• Poisson Regression •	Chalk & Board			
15.		L 8.1	• Analysis of Covariance • Time Series Analysis • Nonlinear Least Square	Power point presentation, Chalk & Board	19-9-17	1.3, 2.2	
16.	**Module 6**	L 8.2	• Decision Tree • Random Forest • Survival Analysis • Chi Square Tests • Practice assignment	Power point presentation, Chalk & Board	20-9-17	1.2, 2.2	
17.		L 9.1	• Collecting twitter data with Twitter API • Naive Bayes Algorithm	Power point presentation, Chalk & Board	03-10-17	1.3	
18.		L 9.2	• Feature Engineering with text data • Sentiment Analysis	Power point presentation, Chalk & Board	04-10-17	1.3, 2.2	
19.		L 10.1	• Supervised and Unsupervised Learning • Classification • Regression	Power point presentation, Chalk & Board	17-10-17	1.3	
20.		L 10.2	• R Useful Resources • Project Discussions • Interview Questions • Discussion • Revision and Doubt Clearing	Power point presentation, Chalk & Board	18-10-17	1.2	

Remark:
Course: Syllabus Coverage:

No. of (lectures planned)/(lecture taken):**20 Hours**

Reference Books:

1.1. R Programming For Data Science by Roger D.Peng
1.2. Exploratory Data Analysis With R by Roger D.Peng
1.3. R In Action by Robert Kabacoff
1.4. R Cook-Book by Paul Teetor

Digital Reference:

2.1. http://www.r-bloggers.com/
2.2. http://www.ats.ucla.edu/stat/r/
2.3. https://www.rstudio.com/online-learning/#R

Mr. Shridhar KambleDr. Rajesh Bansode
Name & Signature of Faculty **Signature of HOD** **Signature of Principal /Dean (Academics)**
Date: **Date:** **Date:**