

TCET/FRM/IP-02/09						Revision: A	
Bridge Course Plan							
Semester: VI				Course: IT			
Subject: Data Science and Visualization using R				2 Lectures / Week		Class: TE IT B	
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	<ul style="list-style-type: none"> <li>• History</li> <li>• Downloading and Installing R</li> <li>• Getting Help on a function</li> <li>• Viewing Documentation</li> <li>• General issues in R</li> <li>• Packages Management</li> <li>• Features</li> <li>• Basics in R</li> <li>• Data Types</li> <li>• Variables</li> <li>• Operators</li> </ul>	Power point presentation, Chalk & Board	15-1-19	1.2, 2.1	
2.		L 1.2	<ul style="list-style-type: none"> <li>• Strings</li> <li>• Vectors</li> <li>• Lists</li> <li>• Matrices</li> <li>• Arrays</li> <li>• Factors</li> </ul>	Power point presentation, Chalk & Board	16-1-19	1.2, 2.1	
3.	Module 2	L 2.1	<ul style="list-style-type: none"> <li>• Data Frames</li> <li>• Decision Making</li> <li>• Loops</li> </ul>	Power point presentation, Chalk & Board	22-1-19	1.2	
4.		L 2.2	<ul style="list-style-type: none"> <li>• Functions</li> <li>• Packages</li> <li>• Data Reshaping</li> </ul>	Power point presentation, Chalk & Board	23-1-19	1.2	
5.		L 3.1	<ul style="list-style-type: none"> <li>• Data Types</li> <li>• Sub setting</li> <li>• Writing data</li> <li>• Reading tabular data files</li> <li>• Reading from CSV Files, Excel Files, Binary Files</li> </ul>	Power point presentation, Chalk & Board	29-1-19	1.1	
6.	Module 3	L 3.2	<ul style="list-style-type: none"> <li>• Reading from XML Files, JSON Files</li> <li>• Web Data</li> <li>• Database</li> </ul>	Power point presentation, Chalk & Board	30-1-19	1.1	

7.		L 4.1	<ul style="list-style-type: none"> <li>• Creating a vector and vector operations</li> <li>• Initializing a data frame</li> <li>• Control structures</li> <li>• Selecting data frame cols by position and name</li> <li>• Changing directories Re-directing R output</li> </ul>	Power point presentation, Chalk & Board	05-02-19	1.1	
8.		L 4.2	<ul style="list-style-type: none"> <li>• Need for data visualization</li> <li>• Data visualization Components</li> <li>• Creating a Pie Charts, Bar Charts, Boxplots</li> </ul>	Power point presentation, Chalk & Board	06-02-19	1.1, 2.1	
9.		L 5.1	<ul style="list-style-type: none"> <li>• Creating a Histograms, Line Graphs, Scatterplots</li> <li>• Utility and limitations</li> <li>• Introduction to grammar of graphics</li> <li>• Using the ggplot2 package in R to create visualizations</li> </ul>	Power point presentation, Chalk & Board	12-02-19	1.2	
10.	Module 4	L 5.2	<ul style="list-style-type: none"> <li>• Appending data to a vector</li> <li>• Combining multiple vectors</li> <li>• List management</li> <li>• Merging data frames</li> <li>• Data transformation</li> <li>• Strings and dates</li> <li>• Outlier detection</li> <li>• Handling NAs and Missing Values</li> <li>• Matrices and Arrays</li> </ul>	Power point presentation, Chalk & Board	13-02-19	1.2, 2.1	
11.		L 6.1	<ul style="list-style-type: none"> <li>• Logical operations</li> <li>• Relational operators</li> <li>• Accessing Variables</li> <li>• Matrix Multiplication and Inversion</li> <li>• Managing Subset of data</li> <li>• Character manipulation</li> <li>• Data aggregation</li> <li>• Subscripting</li> </ul>	Power point presentation, Chalk & Board	20-02-19	1.2	
12.	Module 5	L 6.2	<ul style="list-style-type: none"> <li>• Basics of SQL</li> <li>• RODBC and DBI Package</li> <li>• Performing queries</li> <li>• Advanced Data Handling</li> <li>• Combining and restructuring data frames</li> </ul>	Power point presentation, Chalk & Board	05-03-19	1.2, 2.1	

13.		L 7.1	<ul style="list-style-type: none"> <li>• Mean, Median &amp; Mode</li> <li>• Linear Regression</li> <li>• Multiple Regression</li> <li>• Logistic Regression</li> </ul>	Power point presentation, Chalk & Board	06-03-19	1.2	
14.		L 7.2	<ul style="list-style-type: none"> <li>• Normal Distribution</li> <li>• Binomial Distribution</li> <li>• Poisson Regression</li> <li>•</li> </ul>	Power point presentation, Chalk & Board	12-03-19	1.2, 2.1	
15.		L 8.1	<ul style="list-style-type: none"> <li>• Analysis of Covariance</li> <li>• Time Series Analysis</li> <li>• Nonlinear Least Square</li> </ul>	Power point presentation, Chalk & Board	19-03-19	1.3, 2.2	
16.	<b>Module 6</b>	L 8.2	<ul style="list-style-type: none"> <li>• Decision Tree</li> <li>• Random Forest</li> <li>• Survival Analysis</li> <li>• Chi Square Tests</li> <li>• Practice assignment</li> </ul>	Power point presentation, Chalk & Board	20-03-19	1.2, 2.2	
17.		L 9.1	<ul style="list-style-type: none"> <li>• Collecting twitter data with Twitter API</li> <li>• Naive Bayes Algorithm</li> </ul>	Power point presentation, Chalk & Board	26-03-19	1.3	
18.		L 9.2	<ul style="list-style-type: none"> <li>• Feature Engineering with text data</li> <li>• Sentiment Analysis</li> </ul>	Power point presentation, Chalk & Board	27-03-19	1.3, 2.2	
19.		L 10.1	<ul style="list-style-type: none"> <li>• Supervised and Unsupervised Learning</li> <li>• Classification</li> <li>• Regression</li> </ul>	Power point presentation, Chalk & Board	02-04-19	1.3	
20.		L 10.2	<ul style="list-style-type: none"> <li>• R Useful Resources</li> <li>• Project Discussions</li> <li>• Interview Questions</li> <li>• Discussion</li> <li>• Revision and Doubt Clearing</li> </ul>	Power point presentation, Chalk & Board	03-04-19	1.2	
Remark: Course:		Syllabus Coverage:					
No. of (lectures planned)/(lecture taken): <b>20 Hours</b>							



**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 Kamble**

**Dr. Rajesh Bansode**

**Name & Signature of Faculty  
(Academics)**

**Signature of HOD**

**Signature of Principal /Dean**

**Date:**

**Date:**

**Date:**

**Note:**

1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non -digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.