

Branch Name:	Artificial Intelligence And Data Science
Program Code:	ET108
Semester/Year:	Semester V / Third Year
Course Name:	R Programming for Data Science Practical
Course Code:	2ET1080502P
Pre-requisite:	Knowledge of statistical theory in mathematics. Understanding of different types of graphs for data representation and most important is that we should have prior knowledge of any programming.

Course Objective:

1. Understand the use of the R and R Studio interactive environment
2. Expand R by installing R packages
3. Utilize and R Data types for developing programs.
4. Understand the different data structures in R

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme(Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	-	-	2	2	-	-	-	-	10	25	10	25	50

Sr. No	List of Practical	Content Hours
1.	Installation of R in Windows.	2
2.	Create an R Program to Take Input From the User.	2
3.	Write a program to store data into Data frame and perform different operations over it.	2
4.	Write a program to find biggest of three elements.	2
5.	Write a program to make a simple calculator that can add, subtract, multiply and divide using switch cases and functions.	2
6.	Write a program to find factorial of a number using recursion.	2
7.	Write a program to create a simple bar plot of five subjects marks.	2
8.	Write a program to take input from the user (name and age) and display the values. Also print the version of R installation.	2
9.	Write a program to get the details of the objects in memory.	2
10.	Write a program to Annotating Text and Labels in Plots.	2
11.	Write a program to Visualizing Geographic Data with Maps.	2
12.	Write a program to get the unique numbers of a given string and unique numbers of vector.	2

13.	Write a program to create and manipulate a time series data object.	2
14.	Write a program to implement a simple linear regression model and visualize the results.	2
15.	Write a program to read data from a CSV file and perform basic analysis (e.g., mean, median, standard deviation)	2
16.	Project work.	2

List of 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. Applied statistics and probability for engineers. John Wiley & Sons, 2010
8. Joseph F Hair, William C Black et al , “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.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Show the installation of R Programming Environment	1 Remembering 2 Understanding
CLO2	Utilize and R Data types for developing programs.	1 Remembering 2 Understanding
CLO3	Make use of different R Data Structures.	4 Analyze
CLO4	Develop programming logic using R Packages.	3 Applying
CLO5	Analyze the datasets using R programming capabilities	3 Applying

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CLO1	H	M			M	L	H		M	L		H	H	M	L	
CLO2	H	H			M			L		M		M		H	H	
CLO3	H	L	M		M	L		L		M	L			H		L
CLO4	H	M	H	M	M			M			M	L	L		M	H
CLO5	H	M	H	H	L	M			M		L	L		M	H	

H: High, M: Medium, L: Low