



University of Kerala

Discipline	STATISTICS				
Course Code	UK4SECSTA202				
Course Title	STATISTICAL ANALYSIS USING R				
Type of Course	SEC				
Semester	IV				
Academic Level	200 – 299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	3	2 hours	-	2 hours	4
Pre-requisites					

COURSE OUTCOMES

Up on Completion of the course, students should be able to:		Cognitive level	PSO addressed
CO1	Explain the basic concepts of R software	Understand	PSO2
CO2	Use R tools for descriptive statistical analysis	Apply	PSO1
CO3	Illustrate data Visualization using R	Analyse	PSO5
CO4	Evaluation of statistical relationships using R tools	Evaluate	PSO2, PSO4

R-Remember, U-Understand, Ap -Apply, An-Analyse, E-Evaluate, C-Create

COURSE CONTENT

Module	Content	Hrs
I	Introduction to R software	20
	Source and installation. Importance of R. Basic object – vectors. Basic arithmetic and logical operations, extraction operator. Numeric and character vectors. Basic operations on vectors. c(), seq(), scan(), rep(), cat(), cut(), factor(), table() functions and their uses. Matrices in R: matrix(), dim(), t(), Arrays, lists in R, Concept of data frames, its indexing, conditional selection, attach() and detach() functions.	
II	Sampling and Descriptive measures	20
	Forming ungrouped and grouped frequency tables with raw data using table and cut functions. SRSWR and SRSWOR with sample() Descriptive measures: sum(), sort(), min(), max(), length(), mean(), median(), mode (using sort and table), quantile(). Range, mean deviation, IQR(), quartile deviation, sd(), var(), coefficient of variation, quantile, summary().	

III	Basic Plots	20
	Simple bar plot, multiple bar plot (side by side and subdivided), pie chart, histogram, scatter plot, plot function and lines function. Basic Distributions: Binomial, Poisson, normal, chi-square, t and F distributions – The d , p , q and r functions, the scale function, evaluation of probabilities using these functions. Bivariate data analysis using cov(), Pearson's and Spearman's correlation coefficient using cor(). Linear regression models: fitting using lm(), prediction from fitted model	

REFERENCES

1. Dalgaard, P.(2008). *Introductory Statistics with R*, Springer, New York.
2. Kerns, G J. (2010). *Introduction to Probability and Statistics using R*. ISBN-10 : 0557249791
3. Lander J. P. (2017). *R for everyone 2/e*. Addison-Wesley Professional, U. S.
4. Michael J. Crawley (2013). *The R Book*, 2/e, Wiley, New York.
5. Purohit, S. G., Deshmukh, S.R., & Gore, S. D. (2008). *Statistics using R*. Alpha Science International, United Kingdom.

Web Resources:

1. <https://cran.r-project.org>
2. <https://cran.r-project.org/manuals.html>
3. <https://www.r-project.org/other-docs.html>
4. <https://journal.r-project.org/>
5. <https://www.r-bloggers.com>

Name of the Course: STATISTICAL ANALYSIS USING R
Credits: 2:0:1 (Lecture:Tutorial:Practical)

CO No.	CO	PO/PSO	Cognitive Level	Knowledge Category	Lecture (L)/Tutorial (T)	Practical (P)
CO1	Explain the basic concepts of R software	PSO 2, 5 PO 7	U, Ap	P	L	
CO2	Use R tools for descriptive statistical analysis	PSO 2,3 4,5 PO 1,2,4,7	Ap, An	P	L	
CO3	Illustrate data Visualization using R	PSO 2 PO 4	Ap, U	P, C	L	P
CO4	Evaluation of statistical relationships using R tools	PSO2, PSO4, PO2, PO7	Ap, E	C		P

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

Mapping of COs with PSOs and POs :

	PS O1	PS O2	PS O3	PSO 4	PS O 5	PS O6	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	2	3	2	2	1	1	2	2	2	1	1	2	3	1
CO 2	3	2	2	2	2	1	3	2	2	2	1	2	2	1
CO 3	2	2	2	2	3	2	2	2	2	3	2	2	2	1
CO 4	2	3	2	3	2	2	2	3	2	2	2	2	3	1

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Discussion / Seminar
- Internal Examination
- Practical Evaluation
- End Semester Examinations

Mapping of COs to Assessment Rubrics :

	Internal Exam	Quiz / Assignment/ Discussion / Seminar	Practical Evaluation	End Semester Examinations
CO 1	✓	✓	✓	✓
CO 2	✓	✓	✓	✓
CO 3	✓	✓	✓	✓
CO 4	✓	✓	✓	✓