

**UNIVERSITY OF MADRAS**  
**BACHELOR OF COMPUTER APPLICATIONS (BCA)**  
**DEGREE PROGRAMME**  
**SYLLABUS WITH EFFECT FROM 2023-2024**

**Year: III**

**Semester: VI**

<b>R-Programming Practical</b> Common for B.C.A. , B.Sc.-SA , B.Sc.-CSc-wDS	<b>320C61</b>
<b>Credits 4</b>	<b>Lecture Hours:6 per week</b>
<p><b>Learning Objectives:</b> (for teachers: what they have to do in the class/lab/field)</p> <ul style="list-style-type: none"> <li>• Acquire programming skills in core R Programming</li> <li>• Acquire Object-oriented programming skills in R Programming.</li> <li>• Develop the skill of designing graphical-user interfaces (GUI) in R Programming</li> <li>• Acquire R Programming skills to move into specific branches</li> </ul>	
<p><b>Course Outcomes:</b> (for students: To know what they are going to learn)</p> <p>CO1: To understand the problem solving approaches</p> <p>CO2: To learn the basic programming constructs in R Programming</p> <p>CO3: To practice various computing strategies for R Programming -based solutions to real world problems</p> <p>CO4: To use R Programming data structures - lists, tuples, dictionaries.</p> <p>CO5: To do input/output with files in R Programming</p>	

**List of Exercises**

1. Data In R
2. Reading And Writing Data
3. R And Databases
4. Dates
5. Factors
6. Subscribing
7. Character Manipulation
8. Data Aggregation
9. Reshaping DataBasics
10. The R Environment
11. Probability And Distributions
12. Descriptive Statistics And Graphics
13. One- And Two-Sample Tests
14. Regression And Correlation
15. Analysis Of Variance And The Kruskal–Wallis Test
16. Tabular Data
17. Power And The Computation Of Sample Size
18. Advanced Data Handling
19. Multiple Regression
20. Linear Models
21. Logistic Regression
22. Survival Analysis
23. Rates And Poisson Regression
24. Nonlinear Curve Fitting

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**Learning Resources:**

**Recommended Texts**

1. Roger D. Peng, "R Programming for Data Science", 2012
2. Norman Matloff, "The Art of R Programming- A Tour of Statistical Software Design", 2011

**Reference Books**

1. Garrett Golemund, Hadley Wickham, "Hands-On Programming with R: Write Your Own Functions and Simulations", 1st Edition, 2014
2. Venables, W.N., and Ripley, "S programming", Springer, 2000.