

R PROGRAMMING (Practical based)			
Course Code	21CSL483	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	1:0:0:0	SEE Marks	50
Total Hours of Pedagogy	12T + 12P	Total Marks	100
Credits	01	Exam Hours	02
Course Objectives: CLO 1. Explore and understand how R and R Studio interactive environment. CLO 2. To learn and practice programming techniques using R programming. CLO 3. Read Structured Data into R from various sources. CLO 4. Understand the different data Structures, data types in R. CLO 5. To develop small applications using R Programming			
Teaching-Learning Process (General Instructions) These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes. <ol style="list-style-type: none">1. Lecturer method (L) need not to be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.2. Use of Video/Animation to explain functioning of various concepts.3. Encourage collaborative (Group Learning) Learning in the class.4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it.6. Introduce Topics in manifold representations.7. Show the different ways to solve the same problem with different circuits/logic and encourage the students to come up with their own creative ways to solve them.8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.			
Module-1			
Numeric, Arithmetic, Assignment, and Vectors: R for Basic Math, Arithmetic, Variables, Functions, Vectors, Expressions and assignments Logical expressions.			
Textbook 1: Chapter 2(2.1 to 2.7)			
Teaching-Learning Process	Chalk and board, Active Learning, practical based learning		
Module-2			
Matrices and Arrays: Defining a Matrix, Sub-setting, Matrix Operations, Conditions and Looping: if statements, looping with for, looping with while, vector based programming.			
Textbook 1: Chapter 2- 2.8, chapter 3- 3.2 to 3.5			
Teaching-Learning Process	Chalk and board, Active Learning, Demonstration, presentation, problem solving		
Module-3			
Lists and Data Frames: Data Frames, Lists, Special values, The apply family.			
Textbook 1: Chapter 6- 6.2 to 6.4			
Teaching-Learning Process	Chalk and board, Demonstration, problem solving		
Module-4			
Functions: Calling functions, scoping, Arguments matching, writing functions: The function command, Arguments, specialized function.			
Textbook 1: Chapter 5- 5.1 to 5.6			

Teaching-Learning Process	Chalk and board, Practical based learning, practical's
Module-5	
Pointers: packages, frames, de bugging, manipulation of code, compilation of the code.	
Textbook 1: Chapter 8- 8.1 to 8.8	
Teaching-Learning Process	Chalk and board, MOOC
Course Outcomes (Course Skill Set): At the end of the course the student will be able to: <ul style="list-style-type: none"> CO 1. To understand the fundamental syntax of R through readings, practice exercises, CO 2. To demonstrations, and writing R code. CO 3. To apply critical programming language concepts such as data types, iteration, CO 4. To understand control structures, functions, and Boolean operators by writing R programs and through examples CO 5. To import a variety of data formats into R using R-Studio CO 6. To prepare or tidy data for in preparation for analyze. 	
Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. The student has to secure not less than 35% (18 Marks out of 50) in the semester-end examination (SEE). Continuous Internal Evaluation (CIE): <i>NOTE: List of experiments to be prepared by the faculty based on the syllabus mentioned above</i> CIE marks for the practical course is 50 Marks. The split-up of CIE marks for record/ journal and test are in the ratio 60:40. <ul style="list-style-type: none"> • Each experiment to be evaluated for conduction with observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments designed by the faculty who is handling the laboratory session and is made known to students at the beginning of the practical session. • Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks. • Total marks scored by the students are scaled down to 30 marks (60% of maximum marks). • Weightage to be given for neatness and submission of record/write-up on time. • Department shall conduct 02 tests for 100 marks, the first test shall be conducted after the 8th week of the semester and the second test shall be conducted after the 14th week of the semester. • In each test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce. • The suitable rubrics can be designed to evaluate each student's performance and learning ability. Rubrics suggested in Annexure-II of Regulation book • The average of 02 tests is scaled down to 20 marks (40% of the maximum marks). The Sum of scaled-down marks scored in the report write-up/journal and average marks of two tests is the total CIE marks scored by the student.	
Semester End Evaluation (SEE): <ul style="list-style-type: none"> • SEE marks for the practical course is 50 Marks. • SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the University • All laboratory experiments are to be included for practical examination. • (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. OR based on the course requirement evaluation rubrics shall be decided jointly by examiners. 	