Course Code	PCS21E07J	Course Name	STATISTICAL DATA ANALYTICS	Course Category	D	Discipline Elective Course	L	T	P	C
							3	0	2	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Science		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Disciplinary Knowledge	Critical Thinking	Problem Solving	Analytical Reasoning	Research Skills	Team Work	Scientific Reasoning	Reflective Thinking	Self-Directed Learning	Multicultural Competence	Ethical Reasoning	Community Engagement	PSO 1	PSO 2	PSO 3
CLR-1 :	*Familiarize the concepts of design experts*																		
CLR-2 :	*Understand the various advantages of statistical analysis*																		
CLR-3 :	*Examine the basis of response methodologies*																		
CLR-4 :	*Understanding optimality and filtering error rate*																		
CLR-5 :	*Acquire the latest knowledge of split plot design and custom design*																		
Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:																		
CLO-1 :	*Identify the process of standard deviation, sampling distribution*	3	80	70	L	H	-	H	L	-	-	-							
CLO-2 :	*Analyze and specify factorial design and basis of levels of design*	3	85	75	M	H	L	M	L	-	-	-							
CLO-3 :	*Design various responses, Behnken Design and optimization techniques.*	3	75	70	M	H	M	H	L	-	-	-					-	-	-
CLO-4 :	*Develop Plackett - Burman Design and Taguchi Outer Array Design*	3	85	80	M	H	M	H	L	-	-	-					-	-	-
CLO-5 :	*Perform by applying Plotting Split - plot Design and Simplex Lattic Design*	3	85	75	H	H	M	H	L	-	-	-					-	-	-

Duration(Hour)		15	15	15	15	15
S-1	SLO-1	*Introduction to Design Experiment*	*Introduction to Factorial Design*	*Introduction to response Surface Methodology*	*Introduction to Computer Generated Design's*	*Introduction to Split - Plot Design*
	SLO-2	*Strategy of Experimentation*	*Factorial Design Basic Principles*	*The method of Steepest Ascent*	*Optimal Design's*	*Plotting Split - plot Design*
S-2	SLO-1	*Guidelines for Designing Experiments*	*The advantage of Statistical Analysis*	*Analysis of Second - Order Response Surface*	*Methods in Optimal Design*	*Whole Plot and Subplot Design's*
	SLO-2	*Measures of Central Tendency*	*Power calculation of Factorial Design*	*Characterizing the Response Surface*	*An irregular Experimental Region*	*Other Variation on Split-plot Design*
S-3	SLO-1	*The Arithmetic Mean, Median and Mode*	*2 Level Method in Power Calculation*	*Ridge Surface*	*An Non-Standard Size Requirements*	*Split- plot Design for more than 2 factors*
	SLO-2	*Introduction to Dispersion Measurement*	*Entering data and its Responses*	*Canonical Model in Ridge Surface*	*Design of Optimality Criteria*	*Custom Design*
S-4 to S-5	SLO-1	*Laboratory1: Experiment on Measures of Central Tendency*	*Laboratory4: Experiment on How to Enter the Response data.*	*Laboratory 7: Experimental Design for Fitting Ridge system*	*Laboratory10: Experiment on Optimal Design*	*Laboratory 13: Experiment on Split - Plot Method*
S-6	SLO-1	*Dispersion Variability*	*Estimating the Model Parameters*	*Multiple Response Approaches*	*Robust Parameter Design*	*Analysis of Custom Design*
	SLO-2	*The Range*	*Analysis of Data*	*Formal Optimization*	*Taguchi Outer Array Design*	*Blank Spreadsheet Design*
S-7	SLO-1	*The Quartile*	*Process of Data*	*Formal Optimization Methods*	*Combined Array Design*	*Historical Data - The Introduction*
	SLO-2	*The Variance and its Populations*	*Introduction to 2K Factorial Design*	*Formal Optimization in multiple Response*	*Method in Combined Array Design*	*A Peculiarity on Pasting Data*
S-8	SLO-1	*The Standard Deviation*	*The 2 - Level Design*	*Design for First - Order Model*	*Progration of errors*	*Selection of process order and Linear*
	SLO-2	*Root mean Deviation*	*The 3 - Level Design*	*Design for Second - Order model*	*Filtering errors Rate*	*Combined Mixture Model*

Duration(Hour)		15	15	15	15	15
S-9 to S-10	SLO-1	*Laboratory 2: Experiment on Arithmetic Mean, Median and Mode.*	*Laboratory 5: Pre - Analysis of Effects via Data Sorts and Scatter Plots*	*Laboratory 8: Experiment on Central Composite Design(CCD)*	*Laboratory 11: Experiment on Taguchi Outer Array Design*	*Laboratory14: Optimal (Custom) Design in Split - Plot*
S-11	SLO-1	*Symmetry*	*Design Projection's for Normal Probability Plot*	*Central Composite Design*	*Evolutionary Operation*	*Process of Combined Mixture Model*
	SLO-2	*Skewness*	*Data Transformation in Factorial Design*	*Sperical CCD*	*Plackett - Burman Design*	*Factorial With Mixed - level*
S-12	SLO-1	*Kurtosis*	*Duplicate Measurements on the Response data*	*The Box - Behnken Design*	*Method in PB Design*	*Simplex Lattic Design*
	SLO-2	*Sampling Method*	*The composite design for 2 & 3 Factor's*	*Cuboidal Region of Interest for Box - Behnken Design*	*Design Matrix for Plackett - Burman*	*Simplex Lattic Design for Optimized Texture*
S-13	SLO-1	Sampling Distribution	Choosing Effects to Model	Other Designs in BB Design	Various steps in Screening Design	Introduction of Optimal Design
	SLO-2	*The central Limit Theorem.*	*Pareto Chart and its Plotting*	*2 - Variable Response Surface*	*PB design for Medium Optimization*	*Optimal Design for Combined mixture process Design*
S-14 to S-15	SLO-1	*Laboratory3: Experiment on Symmetry, Skewness, Kurtosis. (SSK)*	*Laboratory6: Experiment on Regular 2 - Level Factorial Design*	*Laboratory 9: Experiment design for Box - Behnken Design*	*Laboratory12: Experimental Design for Box - Behnken Design.*	*Laboratory 15: Experiment on Simplex Lattin Design*

Learning Resources	
	1. Richard Petersen - Linux : The Complete Reference ,Sixth edition . 2. Richard Stevens .W & Stephen Rago (2005), Advanced Programming in the UNIX Environment, 2nd Edition, Pearson Education, New Delhi (UNIT I,2 & 3). 3. Richard Stevens .W (1999), UNIX Network Programming, Volume II, Prentice Hall, New Delhi (UNIT IV&5). 4. Stephen A.Rago (1993), Unix System V Network Programming, Addison Wesley, New York.

Learning Assessment

Bloom's Level of Thinking		Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
	Understand										
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
	Analyze										
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
	Create										
	Total	100 %		100 %		100 %		100 %		100%	

CLA – 4 can be from any combination of these: Assignments, Seminars, Short Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.,

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr. S. Karthik, Assistant Consultant, Tata Consultancy Services	Dr.S.Sasikala, Associate Professor and Head, Dept. of Computer Science, University of Madras	Dr.S.P.Angelin Claret
		Dr. Kalpana