

15MA305	STATISTICS FOR INFORMATION TECHNOLOGY			L	T	P	C
				4	0	0	4
<i>Co-requisite:</i>	NA						
<i>Prerequisite:</i>	15MA203 & 15MA207						
<i>Data Book / Codes/Standards</i>	Statistical Tables and control chart constant values to be provided.						
<i>Course Category</i>	B	CORE			MATHEMATICS		
<i>Course designed by</i>	DEPARTMENT OF MATHEMATICS						
<i>Approval</i>	-- Academic Council Meeting -- 2016						

PURPOSE	The purpose of this course is to make the students learn about the applications of statistical tools and techniques in different field.		
INSTRUCTIONAL OBJECTIVES		STUDENT OUTCOMES	
At the end of the course, student will be able			
1.	To gain knowledge in measures of central tendency and dispersion	a	e
2.	To learn about methods of studying correlation and regression.	a	e
3.	To have knowledge about analysis of time series	a	e
4.	To gain knowledge about ANOVA	a	e
5.	To understand the fundamentals of quality control and the methods used to control systems and processes	a	e

Session	Description of Topic	Contact hours	C-D-I-O	IOs	Reference
	UNIT I: INTRODUCTION TO STATISTICS (numerical problems only)	12			
1.	Introduction to uni-variate data	1	C, I	1	1-7
2.	Measures of central tendency: Arithmetic mean, Median, Definition, Problems	2	C, I	1	1-7
3.	Mode, Geometric Mean and Harmonic Mean: Definition, Problems	2	C, I	1	1-7
4.	Measures of dispersion: Range, Quartile deviation, Mean deviation, Definition, Problems	2	C, I	1	1-7
5.	Standard deviation and Co-efficient of variation: Definition, Problems	2	C, I	1	1-7
6.	Skewness, Definition, Problems	1	C, I	1	1-7
7.	Kurtosis and Moments, Definition, Problems	2	C, I	1	1-7
	UNIT II: CORRELATION AND REGRESSION ANALYSIS	11			
8.	Introduction to Correlation analysis, Types of correlation	1	C, I	2	1-7
9.	Methods of studying correlation - Karl Pearson's coefficient of correlation	2	C, I	2	1-7
10.	Rank correlation method	2	C, I	2	1-7
11.	Partial and Multiple Correlation	2	C, I	2	1-7

12.	Introduction to Regression analysis – Regression lines	1	C,I	2	1-7
13.	Properties of Regression coefficients, Problems	2	C,I	2	1-7
14.	Angle between two regression lines.	1	C,I	2	1-7
	UNIT III: ANALYSIS OF TIME SERIES	12			
15.	Components of time series – Problems of classifications – Methods of measuring trends	1	C,I	3	1,3,4
16.	Freehand graphing method, semi average method	2	C,I	3	1,3,4
17.	moving average method	2	C,I	3	1,3,4
18.	method of least squares	2	C,I	3	1,3,4
19.	Introduction to Measurement of seasonal variation	1	C,I	3	1,3,4
20.	Method of simple averages (weekly, monthly and quarterly)	2	C,I	3	1,3,4
21.	Ratio to trend method	2	C,I	3	1,3,4
	UNIT IV: ANALYSIS OF VARIANCE	13			
22.	Introduction to Small sample tests based on t and F distribution	1	C,I	4	1-4
23.	Test for single mean, difference between means,	2	C,I	4	1-4
24.	Paired t-test, Test for equality of variances,	2	C,I	4	1-4
25.	ANOVA- one -way classification	2	C,I	4	1-4
26.	Two-way classification.	2	C,I	4	1-4
27.	Non-Parametric Test: The Mann Whitney test,	2	C,I	4	1,3,6
28.	The Kruskal-Wallis single-factor analysis of variance by ranks, Procedure and problems	2	C,I	4	1,3,6
	UNIT V: STATISTICAL QUALITY CONTROL	12			
29.	Introduction - Process control	1	C,I	5	1,3,4
30.	control charts for variables - Mean and Range chart (X Bar and R)	2	C,I	5	1,3,4
31.	control charts for variables - Mean and Standard deviation chart (X Bar and s)	2	C,I	5	1,3,4
32.	Introduction to Attributes Control charts	1	C,I	5	1,3,4
33.	Control chart for the number of defectives (np-chart)	2	C,I	5	1,3,4
34.	Control chart for the fraction of defectives (p-chart)	2	C,I	5	1,3,4
35.	Control chart for the number of defects (c-chart)	2	C,I	5	1,3,4
	Total contact hours	60			

LEARNING RESOURCES	
Sl. No.	TEXT BOOKS
1.	C.Chatfield, "Statistics for Technology- A course in Applied Statistics", Chapman and Hall, 2010.
REFERENCE BOOKS/OTHER READING MATERIAL	
2.	S.C.Gupta and V.K.Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand and Sons, New Delhi, 11 th edition,2007.
3.	S.P.Gupta,"Elements of business Statistics", Sultan Chand and Sons, New Delhi, 1993.
4.	S.C.Gupta and V.K.Kapoor, "Fundamentals of Applied Statistics", Sultan Chand and Sons, New Delhi, 2003.
5.	R.S.N.Pillai, & V.Bagavathi, "Statistics – Theory and Practice", Sultan Chand & Sons, 2009.
6.	John E. Freund's: Mathematical statistics with Application, Miller and Miller, Pearson Education, 2012.
7.	V.K.Kapoor, "Statistic – Problems and Solutions", 5 th edition, Sultan Chand & Sons, 2007.

Course nature					Theory		
Assessment Method (Weightage 100%)							
In-semester	Assessment tool	Cycle test I	Cycle test II	Cycle Test III	Surprise Test	Quiz	Total
		Weightage	10%	15%	15%	5%	5%
End semester examination Weightage							50%