

DEPARTMENT OF ECONOMICS				CLASS: I M.A. Economics				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours/week	CIA	Ext	Total
II	Major Core -6	21P2VMC6	Statistics for Economists	4	6	25	75	100

Nature of Course			
Knowledge and skill	✓		Employability oriented
Skill oriented			Entrepreneurship oriented

Course Objectives:
1. To understand statistical sampling data, and graph
2. To know the correlation and regression analysis
3. To inculcate parametric and non-parametric test

Unit	Description	Hours	K-Level	CLO
I	<b>Sampling, Data and Graph</b> Sampling methods: Probability and Non-probability sampling – Classification and tabulation of data: Types of classification, formation of discrete frequency distribution, formation of continuous frequency distribution and tabulation of data – Diagrammatic and graphic representation: Significance, general rules, types of diagrams, graphs and graphs of frequency distribution.	18	Up to K4	1
II	<b>Correlation Analysis</b> Significance – Correlation and causation Types – Method of Least Squares - Interpreting the correlation coefficient – Correlation of time series – Partial correlation: Meaning, Partial correlation coefficients, characteristics, uses, significances and partial correlation coefficient estimation (3 variables).	18	Up to K4	2
III	<b>Regression Analysis</b> Meaning – Significance – Uses – Difference between correlation and regression – Regression line of X on Y and Y on X: Algebraic method – Regression equations of X on Y and Y on X: Arithmetic mean method and Assumed mean method – Regression coefficients – Standard Error Estimation – Co-efficient determination.	18	Up to K4	3
IV	<b>Testing of Hypothesis – Parametric Test</b> Hypothesis testing and estimation – Sampling distribution – Standard error – Procedure of hypothesis testing - Type I and Type II error – One tailed and Two tailed tests – Properties of normal distribution - Z-test (Large Sample): Assumptions, test for specified population mean and test for two means – t- test (Small sample): Assumptions, test for specified mean, test for two means, paired comparison test and co-efficient of correlation test – F-test (Small sample): Properties, test for equality of two variances.	18	Up to K4	4

V	<b>Testing of Hypothesis – Non-Parametric Test</b> Definition - Characteristics – Properties – Important applications – Cautions applying chi-square test - Test for goodness of fit, test of independence of attributes and test for a specified population variance.	18	Up to K4	5
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### Books for Study

1. S.P.Gupta and M.P.Gupta, “**Business Statistics**”, 2012, Sultan Chand & Sons, New Delhi.
2. R.S.N.Pillai and Bagavathi, “**Statistics – Theory and Practice**”, 2010, S.Chand & Company, New Delhi.
3. D.Kathambarajan, “**Economic and Business Statistics**”, 2011, Himalaya Publishing House, Mumbai.

### Books for References

1. S.P.Gupta, “**Statistical Methods**”, 2014, Sultan Chand and Sons, New Delhi.
2. S.C.Gupta and V.K.Kapoor, “**Fundamentals of Applied Statistics**”, 2003, Sultan Chand and Sons, New Delhi.
3. D.N.Elhance, “**Fundamentals of Statistics**”, 1964, Kitab Mahal Wholesale Division, New Delhi.

### Web Resources

1. Darius Singpurwalla, “**A Handbook of Statistics – An Overview of Statistical Methods**”, <http://bookboon.com/en/a-handbook-of-statistics-ebook>
2. Mohamed A.Shaiyup, “**Applied Statistics**”, <http://bookboon.com/en/applied-statistics-ebook>

### Rationale for Nature of the course

Statistics is the unavoidable subject in almost all disciplines. Statistical tools are used in sciences, engineering, medicine and social sciences, particularly in research. Statistics can be used for enumeration and estimation and accuracy with relations. To formulate any policy, population statistics, agriculture situation, industrial statistics, health statistics etc. are essential for Government to take appropriate decisions to safeguard the people of the Nation. Statistics is the only subject which can correlate a variables and forecast the economy.

### Activities having direct bearing on knowledge and skill development/ Employability /

#### Entrepreneurship

Students are advised to collect primary data through a questionnaire or interview schedule and analyse the data with interpretation about socio-economic issues by using statistical tools like averages, correlation, regression, time series and hypothesis testing.

### Pedagogy

Lecture method, PPT, Quiz, Group discussion, Seminar, Interaction, OOC.

### Course Designer

**Dr.S.Karthikeyan**

## Lecture Schedule

Unit	Topics	Hours	Mode
<b>Unit I</b>	Sampling methods: Probability and Non-probability sampling	2	Lecture Method, PPT Seminar, Test
	Classification and tabulation of data: Types of classification, formation of discrete frequency distribution	4	
	Formation of continuous frequency distribution and tabulation of data	4	
	Diagrammatic and graphic representation: Significance, general rules,	4	
	Types of diagrams, graphs and graphs of frequency distribution	4	
<b>Unit II</b>	Significance of correlation , Types of correlation and causation	4	Lecture Method, Seminar, Quiz
	Method of Least Squares, Interpreting the correlation coefficient	4	
	Correlation of time series	2	
	Partial correlation: Meaning, Partial correlation coefficients	4	
	Characteristics of partial correlation, uses, significances and partial correlation coefficient estimation (3 variables)	4	
<b>Unit III</b>	Correlation: meaning, Significance , Uses , Difference between correlation and regression	4	Lecture Method, Seminar, Group Discussion
	Regression line of X on Y and Y on X: Algebraic method	4	
	Regression equations of X on Y and Y on X: Arithmetic mean method	4	
	Regression equations of X on Y and Y on X: Assumed mean method	4	
	Regression coefficients, Standard Error Estimation and Co-efficient determination	2	
<b>Unit IV</b>	Hypothesis testing and estimation , Sampling distribution , Standard error, Procedure of hypothesis testing	4	Lecture Method, Seminar, PPT
	Type I and Type II error, One tailed and Two tailed tests, Properties of normal distribution	4	
	Z-test (Large Sample): Assumptions, test for specified population mean and test for two means	4	
	t- test (Small sample): Assumptions, test for specified mean, test for two means, paired comparison test and co-efficient of correlation test	4	
	F-test (Small sample): Properties, test for equality of two variances	2	
<b>Unit V</b>	Non-parametric test: Definition and Characteristics	4	Lecture Method, Seminar, OOC
	Properties and important applications of non-parametric test	4	
	Cautions applying of chi-square test	4	
	Test for goodness of fit, test of independence of attributes	3	
	Test for a specified population variance	3	
	Total	90	

**Course Learning Outcome:**

On successful completion of the course, the student will be able to:

CLO	Course Learning Outcome	Knowledge Level
CLO1	Relate the statistical sampling methods, data and graphical representation	K4
CLO2	Use the statistical measure to describe the relationship between data	K4
CLO3	Recognise the spread of dataset and its consistency	K4
CLO4	Establish hypothesis with sufficient parametric evidence	K4
CLO5	Establish hypothesis with sufficient non-parametric evidence	K4

**K1** – Remembering

**K2** – Understanding

**K3** – Application

**K4** – Examining, analyzing and presentation

**Mapping of CLOs with POs**

#	PO1	PO2	PO3	PO4	PO5
CLO-1	2	1	2	3	3
CLO-2	3	3	3	2	1
CLO-3	2	2	2	1	3
CLO-4	1	3	3	2	2
CLO-5	3	2	1	2	3

**Measurement of Scaling:** Advanced Application - 3, Intermediate Level – 2, Basic Level – 2

**Learning Outcome Based Education (LOBE) & Assessment****Formative – Blue – Print – Model**

(Articulation Mapping with Course Learning Outcome (CLOs))

Units	CLOs	K-Level	Section - A		Section – B (Either or Choice)	Section – C (Open choice)
			Short Answers			
			No. of Questions	K-Level		
I & II	CLO 1 & 2	Up to K4	2	K2, K3	2 (K3 & K3)	2 (K2, K3)
III, IV	CLO 3 & 4	Up to K4	3	K2, K2, K3	2 (K4 & K4)	1(K3/K4)
No. of questions to be asked			5		4	3
No. of questions to be answered			5		2	2
Marks for each question			2		5	10
Total marks for each section			<b>10</b>		<b>10</b>	<b>20</b>

**Learning Outcome Based Education (LOBE) & Assessment**  
**Summative – Blue – Print – Model**  
**(Articulation Mapping with Course Learning Outcome (CLOs))**

Unit	CLOs	K-Level	Section – A MCQs		Section – B Short Answer		Section – C (Either or Choice)	Section – D (Open Choice)
			No. of Questions	K-Level	No. of Questions	K- Level		
I	<b>CLO-1</b>	Up to K4	2	K1 & K1	1	K1	2 (K3 & K3)	1 (K2)
II	<b>CLO-2</b>	Up to K4	2	K2 & K3	1	K2	2 (K1 & K1)	1 (K3)
III	<b>CLO-3</b>	Up to K4	2	K2 & K3	1	K1	2 (K4 & K4)	1 (K3)
IV	<b>CLO-4</b>	Up to K4	2	K3 & K4	1	K3	2 (K4 & K4)	1 (K4)
V	<b>CLO-5</b>	Up to K4	2	K2 & K3	1	K2	2 (K2 & K2)	1 (K4)
No. of questions to be asked			10		5		10	5
No. of question to be answered			10		5		5	3
Marks for each question			1		2		5	10
Total marks for each			<b>10</b>		<b>10</b>		<b>25</b>	<b>30</b>

**K1** – Remembering

**K2** – Understanding

**K3** – Application

**K4** – Examining, analyzing and presentation

**Distribution of Section-wise Marks with K-Levels**

K Levels	Section – A (No Choice)	Section – B (No Choice)	Section – C (Either or)	Section – D (Open Choice)	Total Marks	% of Marks without choice
K1	2	4	10	-	16	13.33
K2	2	4	10	10	26	21.67
K3	4	2	10	20	36	30.00
K4	2	-	20	20	42	35.00
<b>Total Marks</b>	<b>10</b>	<b>10</b>	<b>50</b>	<b>50</b>	<b>120</b>	<b>100.00</b>