ST. JOSEPH'S COLLEGE OF ARTS & SCIENCE

(AUTONOMOUS)

CUDDALORE-1

DEPARTMENT OF STATISTICS

SYLLABUS 2019-2020

STATISTICS – CURRICULUM DESIGN TEMPLATE

Semester	Degree	Subject Title	SubjectCode	Hours	Credits
I	I B.Sc Mathematics	Allied Statistics - I	18SMT101	6	4
I	I M.Com	Quantitative Techniques	PCM701A	6	4
II	I B.Sc Mathematics	Allied Statistics - II	18SMT202	6	4
I & II	I B.Sc Mathematics	Allied Statistics Practical	18SMP201	2	2
II	I BCA	Statistical Methods	ASCA202T	5	4
II	I BBA (CA)	Business Statistics and Operations Research	17ABS22	5	4
III	II B. Sc Computer Science	Statistical Methods for Computer Applications – I	19ASCS31	6	4
III	II B. Com / II BBM	Business Statistics	ASCM301Q/ ASBM301Q	5	4
IV	II B.Sc. Computer Science	Statistical Methods For Computer Applications – II	19ASCS42	6	4
III & IV	II B.Sc. Computer Science	Statistical Methodsfor Computer Applications Practical	ASCSP401T	2	2
III	II M.Sc. Microbiology	Biostatistics	EPMB911Q	5	3

I B.Sc. MATHEMATICS	ALLIED STATISTICS – I	18SMT101
SEMESTER – I		HRS/WK – 6
ALLIED		CREDITS – 4

OBJECTIVE:

- ✓ To train the students in mastering the techniques of various applications in statistics

Course Outcomes:

At the end of the Course the students will be able to

- **CO1: Understand the Definition, Uses, Merits and demerits, relationship of Location, Dispersion, Skewness and Kurtosis**
- **CO2: Understand the concept of Probability and its related theorem**
- **CO3: Know the concept of random variables and its use in various density functions**
- **CO4: Understand the concept of Mathematical Expectation its properties and Chebychev's inequality**
- **CO5:Understand the concept of Correlation and Regression and its uses in various fields**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER I	COURSE CODE: ASMT101Q	TITLE OF THE PAPER: ALLIED STATISTICS – I			HOURS:6	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	4	4	4	4	4
CO2	5	5	5	4	5	4.8
CO3	4	4	4	4	4	4
CO4	4	4	4	4	5	4.2
CO5	5	5	5	5	5	5
Mean Overall Score						4.4

Result: This Course is having **VERY HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Measures of Locations and Dispersion. Skewness and Kurtosis.

UNIT – II

Probability: Basic definitions – Axiomatic approach to Probability – Basictheorems on Probability – Addition theorem on probability and related problems - Conditional probability – Multiplication theorem of probability and related problems – Independent events – Pair wise Independent events (definition only) - Baye's theorem and related problems.

UNIT – III

Random Variable – Distribution function and their properties - Discrete random Variable – Probability mass function and simple problems - Continuous random variable – Probability density function and simple problems – Two dimensional random variables – Joint probability mass function, Joint probability density function and simple problems.

UNIT – IV

Mathematical Expectations: Properties of Expectations – Variance, Covariance and their properties. Moment generating function – Characteristics function - Cumulants – Chebychev's inequality (only theorem).

UNIT –V

Correlation: Scatter diagram, Karl Pearson's Coefficient of correlation, Spearman's rank correlation - Partial and Multiple correlations (3 variables only). Regression analysis: Simple regression equations.

Text Books:

1. "Fundamentals of Mathematical Statistics" (11th edition – 2002), Gupta. S. C. and Kapoor. V. K., Sultan Chand & Sons, New Delhi.
2. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.

Reference Books:

1. "Mathematical Statistics" (1st edition – 2002), Vittal. P. R., Margham Publications, Chennai-17
2. "Introduction to Probability and Statistics" (2nd edition – 1939), Vijay Rohatgi. K. and Ehsanes Saleh. A.K., John Wiley & Sons, Inc., New York.
3. "Introduction to Theory of Statistics" (3rd edition - 2001), Alexander M. Mood, Franklin A. Graybill and Duance C Boes, Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M., Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.

I B. Sc MATHEMATICS	ALLIED STATISTICS – II	18SMT202
SEMESTER – II		HRS/WK – 6
ALLIED		CREDITS – 4

OBJECTIVE:

- ✓ To motivate the students to apply the statistical techniques in their respective major subjects.

Course Outcomes:
At the end of the Course the students will be able to

- **CO1: Understand the Discrete distribution & definition, derivation of Mean and variance for each distribution and its moment generating functions**
- **CO2: Understand the Continuous distribution and definition, derivation of Mean and variance for each distribution, concept of sampling distribution and its relationship**
- **CO3: Know the concept of tests of significance (small sample) test and how to apply in real life situation**
- **CO4: Understand the concept of large sample test and its proportion, mean and Standard deviation of correlation coefficients**
- **CO5: Understand the concept of Analysis of variance and its uses, whereas learn how to classify and analyze the problems in various fields**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER II	COURSE CODE: ASMT202T	TITLE OF THE PAPER: ALLIED STATISTICS – II			HOURS:6	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	4	4	4	4	4
CO2	5	5	5	4	5	4.8
CO3	4	4	4	4	4	4
CO4	4	4	4	4	5	4.2
CO5	5	5	5	5	5	5
Mean Overall Score						4.4

Result: This Course is having **VERY HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Discrete distributions: Binomial distribution, Poisson distribution and Geometric distribution – Derivations of mean, variance and moment generation functions.

UNIT – II

Continuous distributions: Uniform (mean, variance and m. g. f.), Exponential (mean, variance and m. g. f.) and Normal distributions (m. g. f., characteristics and area problems). Sampling distributions: Student's t, F and χ^2 distributions (derivations only) and their relationships.

UNIT – III

Tests of Significance (small samples) based on t and F distributions with respect to mean, variance and correlation coefficient. Chi–Square distribution: Test for independence of attributes.

UNIT – IV

Tests of significance (large samples) – Proportion, Mean, Standard deviation and Correlation Coefficient.

UNIT –V

Analysis of Variance: One way and two way classifications. Design of experiments: CRD, RBD and LSD.

Text Books:

1. "Fundamentals of Mathematical Statistics" (11th edition – 2002), Gupta. S. C. and Kapoor. V. K., Sultan Chand & Sons, New Delhi.
2. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.
3. "Fundamentals of Applied Statistics" (2nd edition – 1978), Gupta. S. C. andKapoor. V. K., Sultan Chand & Sons, New Delhi.

Reference Books:

1. "Mathematical Statistics" (1st edition – 2002), Vittal. P. R., Margham Publications, Chennai – 17.
2. "Introduction to Probability and Statistics" (2nd edition – 1939), Vijay Rohatgi. K. and Ehsanes Saleh. A.K., John Wiley & Sons, Inc., New York.
3. "Introduction to Theory of Statistics" (3rd edition - 2001), Alexander M. Mood, Franklin A. Graybill and Duance C Boes , Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M., Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.

I B.Sc. MATHEMATICS	ALLIED STATISTICS PRACTICAL	18SMP201
SEMESTER – I & II		HRS/WK – 2
ALLIED		CREDITS – 2

OBJECTIVE:

✓ To train the students in mastering the techniques of various statistical applications.

Course Outcomes:

At the end of the Course the students will be able to

- **CO1: Understand how to solve measures of Location, Dispersion, Skewness and Kurtosis problems**
- **CO2: Understand how to solve Karl Pearson's coefficients of correlation, Rank correlation and two regression equations**
- **CO3: Set up the hypothesis for small sample test problems and goodness of fit**
- **CO4: Set up the hypothesis for large sample problems with its mean,proportions**
- **CO5: Solve and analyze ANOVA for One way classifications, Two wayclassifications CRD, RBD and LSD**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER I & II	COURSE CODE: ASMTP201Q	TITLE OF THE PAPER: ALLIED STATISTICS PRACTICAL			HOURS:2	CREDITS:2
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	4	4	4	4	4
CO2	5	5	5	4	5	4.8
CO3	4	4	4	4	4	4
CO4	4	4	4	4	5	4.2
CO5	5	5	5	5	5	5
Mean Overall Score						4.4

Result: This Course is having **VERY HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Measures of Location and Dispersion - Skewness and Kurtosis.

UNIT – II

Correlation: Karl Pearson's Coefficient of Correlation, Spearman's Rank Correlation. Regression analysis: Simple regression equations.

UNIT – III

Tests of Significance (Small samples) based on t, F and Chi –Square distributions with respect to Mean and Variance. Test for independence of attributes. Fitting of Binomial, Poisson and Normal distributions (area method only) and test for goodness of fit.

UNIT – IV

Tests of significance (large samples) based on Mean and Proportions.

UNIT –V

Analysis of Variance: One way and two way classifications. Design of experiments: CRD, RBD and LSD.

Text Books:

1. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.
2. "Fundamentals of Applied Statistics" (2nd edition – 1978), Gupta. S. C. andKapoor. V. K., Sultan Chand & Sons, New Delhi.

Reference Books:

1. "Mathematical Statistics" (1st edition – 2002), Vittal. P. R., Margham Publications, Chennai - 17
2. "Introduction to Probability and Statistics" (2nd edition – 1939), Vijay Rohatgi. K. and Ehsanes Saleh. A.K., John Wiley & Sons, Inc., New York.
3. "Introduction to Theory of Statistics" (3rd edition - 2001), Alexander M. Mood, Franklin A. Graybill and Duance C Boes , Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M., Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.

Question Paper Pattern

Time: 3 hours **Marks: 60**

Part – A : (3 x 20 = 60 marks)

Answer any Three questions out of Five questions (with open choice)

II B.Sc. COMPUTER SCIENCE	STATISTICAL METHODS FOR COMPUTER APPLICATIONS – I	19ACSC31
SEMESTER – III		HRS/WK – 6
ALLIED		CREDITS – 4

OBJECTIVE:

- ✓ To motivate the students to understand the theoretical concepts in Statistics.

Course Outcomes:

At the end of the Course the students will be able to

- **CO1: Understand the Scope and limitation of Statistical methods, diagrammatic and graphical representation of data, merits and demerits**
- **CO2: Understand the concept of measures of Location, Dispersion, Absolute and relative measures**
- **CO3: Know the concept of measures of skewness and learn how to measure the samples by the following methods Karl Pearson's, Bowley's, Kelly's Coefficient of Skewness and Skewness, Kurtosis**
- **CO4: Understand the concept of Probability and its related theorem**
- **CO5: Know the concept of random variables and its use in various density functions Understand the concept of Mathematical Expectation its properties and Chebychev's inequality**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER III	COURSE CODE: ASCS301T	TITLE OF THE PAPER: STATISTICAL METHODS FOR COMPUTER APPLICATIONS – I			HOURS:6	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	3	3	5	4	3.8
CO2	4	5	4	4	5	4.4
CO3	5	4	3	4	5	4.2
CO4	3	4	3	3	4	3.4
CO5	4	5	3	5	4	4.2
Mean Overall Score						4

Result: This Course is having **HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Introduction – Scope and limitations of Statistical methods – Classification of data – Tabulation of data – Diagrammatic and Graphical representation of data - Graphical determination of Percentiles and Quartiles.

UNIT – II

Measures of locations, Measures of dispersion – Absolute and Relative measures

UNIT – III

Measures of Skewness: Karl Pearson's, Bowley's, Kelly's Coefficient of Skewness. Kurtosis based on Moments

UNIT – IV

Sample Space – events – definition of Probability, Addition and Multiplications theorems – simple problems. Conditional probability – Baye's theorem (proof only).

UNIT –V

Concept of Random Variable – Probability mass function, Probability density function and Distribution function. Mathematical Expectation: Properties of expectations, Chebychev's inequality (only theorem).

Text Books:

1. "Fundamentals of Mathematical Statistics" (11th edition – 2002), Gupta. S. C. and Kapoor. V. K., Sultan Chand & Sons, New Delhi.
2. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.

Reference Books:

1. "Statistics (Theory and Practice)" (3rd edition - 1993), Pillai. R. S. N. and Bagavathi. V. Sultan Chand & Sons, New Delhi.
2. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M.,Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.
3. "Mathematical Statistics" (1st edition – 2002), Vittal. P. R., MarghamPublications, Chennai – 17.

II B.Sc. COMPUTER SCIENCE	STATISTICAL METHODS FOR COMPUTER APPLICATIONS – II	19ASCS42
SEMESTER – IV		HRS/WK – 6
ALLIED		CREDITS – 4

OBJECTIVE:

- ✓ To motivate the students to understand the theoretical concepts in statistics and make them to apply the concepts in their respective major subjects

Course Outcomes:

At the end of the Course the students will be able to

- **CO1: Understand the concept of Correlation and Regression**
- **CO2: Understand Binomial, Poisson and Normal distributions**
- **CO3: Know the concept of tests of significance -small sample and large sample test**
- **CO4: Understand the concept of Analysis of variance and problems related to CRD, RBD and LSD**
- **CO5: Understand the diagrammatic representation of data, average, median, mode, STDEV, VAR, skewness and kurtosis functions using MS- Excel**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER IV	COURSE CODE: ASCS402T	TITLE OF THE PAPER: STATISTICAL METHODS FOR COMPUTER APPLICATIONS – II			HOURS:6	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	3	3	5	4	3.8
CO2	4	5	4	4	5	4.4
CO3	5	4	3	4	5	4.2
CO4	3	4	3	3	4	3.4
CO5	4	5	3	5	4	4.2
Mean Overall Score						4

Result: This Course is having **HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Correlation: Scatter diagram, Karl Pearson's, Spearman's rank and Concurrent deviation methods. Regression Analysis: Simple regression equations.

UNIT – II

Standard distributions: Binomial (mean and variance) Poisson (mean and variance) and fitting of these distributions. Normal distributions (characteristics and area problems)

UNIT – III

Concept of Sampling distributions – Standard Error – Tests of Significance based on t, Chi –Square and F distributions with respect of Mean, Variance and Correlation coefficient. Chi – Square test for independence of attributes. Goodness of fit. Large sample test based on Mean and Proportions.

UNIT –IV

Analysis of Variance: One way and two way classifications. Basic principles of design of experiments: Randomization, Replication and Local Control – CRD, RBD and LSD.

UNIT – V

Introduction to MS- Excel and its usage in data analysis – representations of statistical data by using diagrams (column diagram, bar diagram, line diagram, scatter diagram and pie diagram). Excel functions regarding descriptive statistics (average, median, mode, STDEV, VAR, skewness and kurtosis functions)

Text Books:

1. "Fundamentals of Mathematical Statistics" (11th edition – 2002), Gupta. S. C. and Kapoor. V. K., Sultan Chand & Sons, New Delhi.
2. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.
3. "Fundamentals of Applied Statistics" (2nd edition – 1978), Gupta. S. C. andKapoor. V. K., Sultan Chand & Sons, New Delhi.

Reference Books:

1. "Statistics (Theory and Practice)" (3rd edition - 1993), Pillai. R. S. N. andBagavathi. V., Sultan Chand & Sons, New Delhi.
2. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M.,Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.
3. "Mathematical Statistics" (1st edition – 2002), Vittal. P. R., MarghamPublications, Chennai – 17

II B.Sc. COMPUTER SCIENCE	STATISTICAL METHODS FOR COMPUTER APPLICATIONS (PRACTICAL)	ASCSP401T
SEMESTER – III & IV		HRS/WK – 2
ALLIED		CREDITS – 2

OBJECTIVE:

- ✓ To motivate the students to apply the statistical techniques in their respective major subjects.

Course Outcomes:

At the end of the Course the students will be able to

- **CO1: Construct Univariate and Bivariate frequency distributions, represent the statistical data diagrammatically and graphically**
- **CO2: Solve measures of Location ,Dispersion, Skewness and Kurtosis problems**
- **CO3: Solve Curve fitting, Karl Pearson's coefficients of correlation , Rank correlation and two regression equations problems**
- **CO4: Solve fitting of Binomial, Poisson, Normal distributions. Hypothesis testing for small and large sample test problems**
- **CO5: Solve and analyze ANOVA for CRD, RBD and LSD**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER III & IV	COURSE CODE: ASCSP401T	TITLE OF THE PAPER: STATISTICAL METHODS FOR COMPUTER APPLICATIONS (PRACTICAL)			HOURS:2	CREDITS:2
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	3	3	5	4	3.8
CO2	4	5	4	4	5	4.4
CO3	5	4	3	4	5	4.2
CO4	3	4	3	3	4	3.4
CO5	4	5	3	5	4	4.2
Mean Overall Score						4

Result: This Course is having **HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Construction of Univariate and Bivariate frequency distributions with samples of size not exceeding 50. Diagrammatic and Graphical representation of various statistical data and frequency distributions. Cumulative frequency curve and Lorenz curve

UNIT – II

Computation of various Measures of Locations, Dispersion, Skewness and Kurtosis based on moments.

UNIT – III

Curve fitting by the method of least squares, fitting of Straight line, fitting of Second degree polynomial, fitting of Power curve and fitting of Exponential curves. Computation of Karl Pearson's Correlation coefficients, Rank Correlation Coefficient. Simple regression equations.

UNIT – IV

Fitting of Binomial, Poisson, Normal distributions (Area Method) and testing its goodness of fit. Exact tests based on t and F distributions with regard to Mean, Variance and Correlation Coefficient. Large sample tests: Based of Mean and Proportions. Chi-Square distribution: Test for independence of attributes.

UNIT –V

Design of Experiments: CRD, RBD and LSD.

Text Books:

1. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.
2. "Fundamentals of Applied Statistics" (2nd edition – 1978), Gupta. S. C. andKapoor. V. K., Sultan Chand & Sons, New Delhi.
3. "Practical Statistics" (2^{nd} edition – 2003), Pillai. R.S.N and Bagavathi, SultanChand & Sons, New Delhi.

Reference Books:

1. "Fundamentals of Applied Statistics" (2nd edition – 1978), Gupta. S. C. andKapoor. V. K., Sultan Chand & Sons, New Delhi.
2. "Statistics (Theory and Practice)" (3rd edition - 1993), Pillai. R. S. N. andBagavathi. V. Sultan Chand & Sons, New Delhi.
3. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M.,Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.
4. "Business Statistics" (1st edition – 2008), Bharat Jhunjhunwala, S. Chand &Company Ltd.

Question Paper Pattern

Time: 3 hours **Marks: 60**

Answer any Three questions out of five questions (with open choice)

I BCA	STATISTICAL METHODS	ASCA202T
SEMESTER – II		HRS/WK – 5
ALLIED		CREDITS– 4

OBJECTIVE:

- ✓ To motivate the students to apply the statistical techniques in their respective major subjects.

Course Outcomes:

At the end of the Course the students will be able to

- **CO1: Understand the Definition, Uses, Merits and demerits of Central tendency, Measures of Dispersion**
- **CO2: Understand the Definition, Uses, Merits and demerits of Skewness and Kurtosis**
- **CO3: Understand the concept of Correlation and Regression and its uses in various fields**
- **CO4: Know the concept of tests of significance (small sample) test and how to apply in real life situation**
- **CO5: Understand the concept of large sample test and its proportion, mean and Standard deviation of correlation coefficients**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER II	COURSE CODE: ASCA202T	TITLE OF THE PAPER: STATISTICAL METHODS			HOURS:5	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	4	4	4	4	4
CO2	5	5	5	4	5	4.8
CO3	4	4	4	4	4	4
CO4	4	4	4	4	5	4.2
CO5	5	5	5	5	5	5
Mean Overall Score						4.4

Result: This Course is having **VERY HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Measures of Central tendency: Arithmetic Mean, Median, Mode, Harmonic Mean and Geometric Mean. Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation and Coefficient of Variation.

UNIT – II

Measures of Skewness: Karl Pearson's coefficient of Skewness, Bowley's coefficient of Skewness and Kelly's coefficient of Skewness. Kurtosis

UNIT – III

Correlation analysis: Karl Pearson's coefficient of correlation, Spearman's rank correlation coefficients. Regression analysis: Simple regression equations.

UNIT – IV

Tests of Significance (small samples) based on t, F distributions with respect of Mean, Variance and Correlation coefficient. Test of Significance based on Chi- Square test: Test for Independence of attributes.

UNIT –V

Test of Significance (large samples) based on Population Proportion, Mean, Variance and Correlation coefficient.

Text Books:

1. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.
2. "Fundamentals of Mathematical Statistics" (11th edition – 2002), Gupta. S. C. and Kapoor. V. K., Sultan Chand & Sons, New Delhi.

Reference Books:

1. "Fundamentals of Applied Statistics" (2nd edition – 1978), Gupta. S. C. andKapoor. V. K., Sultan Chand & Sons, New Delhi.
2. "Statistics (Theory and Practice)" (3rd edition - 1993), Pillai. R. S. N. andBagavathi. V. Sultan Chand & Sons, New Delhi.
3. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M.,Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.
4. "Business Statistics" (1st edition – 2008), Bharat Jhunjhunwala, S. Chand &Company Ltd.
5. "Mathematical Statistics" (1st edition – 2002), Vittal. P. R., MarghamPublications, Chennai – 17

II B.Com/II BBM	BUSINESS STATISTICS	ASBM 301Q /ASCM 301Q
SEMESTER – III		HRS/WK – 5
ALLIED		CREDITS – 4

OBJECTIVE:

- ✓ To motivate the students to apply the statistical techniques in their respective major subjects.

Course Outcomes:
At the end of the Course the students will be able to

- **CO1: Understand Statistics, collection of various data methods andclassification of data into table form and measures of central tendency**
- **CO2: Understand the concept of measures of dispersion**
- **CO3: Understand the concept of Correlation and Regression**
- **CO4: Understand the concept of index number, constructing, trending,learning and predicting situation based on period**
- **CO5: Understand the concept of time series, Formation of trend, andplanning trend line, learning measures of seasonal variation time**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER III	COURSE CODE: ASBM301Q/ ASCM301Q	TITLE OF THE PAPER: BUSINESS STATISTICS			HOURS:5	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	3	3	5	4	3.8
CO2	4	5	4	4	5	4.4
CO3	5	4	3	4	5	4.2
CO4	3	4	3	3	4	3.4
CO5	4	5	3	5	4	4.2
Mean Overall Score						4

Result: This Course is having **HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Introduction: Collection of data – Primary data and Secondary data – Different methods of collecting primary data – Classification and Tabulation of Statistical data. Frequency distribution: Simple and Cumulative. Measures of Central value: Arithmetic Mean, Median, Mode, Geometric Mean and Harmonic Mean.

UNIT – II

Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation-Combined standard deviation and Coefficient of Variation. Measures of Skewness: Karl Pearson's and Bowley's methods.

UNIT – III

Correlation: Karl Pearson's coefficient of correlation, Spearman's rank correlation coefficient and Concurrent deviation method. Regression analysis: Simple regression equations.

UNIT – IV

Index numbers – Uses of index Numbers – Problems in the Construction of Index Numbers – Methods of Constructing Index Numbers – Simple Aggregative Method – Weighted Aggregative Indices – Laspeyre's, Paasche's, Bowley's and Fisher Ideal Method – Weighted Aggregative Indices – Quantity and value Indices – Tests of adequacy of Index Numbers: Time Reversal test, Factor Reversal test (problems only). Family Budget method.

UNIT –V

Time Series – Uses and Components. Measurement of Trend: Semi-average method, Moving Average Method (problems up to 5 yearly) – Least Square Method (Fitting of straight line). Measurement of Seasonal Variation: Method of Simple Averages – Ratio-to-trend Method – Link Relative Method.

Text Books:

1. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.
2. "Business Statistics", Gupta. S. P., Gupta. P. K. and Manmohan.

Reference Books:

1. "Index Numbers, Applied Statistics" (2nd edition), Mudgett Gupta. O. P. &Ansari. M. A., Kadarnath & Co.
2. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M.,Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.
3. "Business Statistics" (1st edition – 2008), Bharat Jhunjhunwala, S. Chand &Company Ltd.

I BBA(CA)	BUSINESS STATISTICAL METHODS	21ABS22
SEMESTER – II		HRS/WK – 5
ALLIED		CREDITS– 4

OBJECTIVE:

- ✓ To motivate the students to apply the statistical techniques in their respective major subjects.

Course Outcomes:
At the end of the Course the students will be able to

- **CO1: Understand Statistics, Collection of various data methods andclassification of data into table form and measures of central tendency**
- **CO2: Understand the concept of measures of dispersion**
- **CO3: Understand the concept of Correlation and Regression**
- **CO4: Understand the concept of index number, constructing, trending,learning and predicting situation based on period**
- **CO5: Understand the concept of time series, Formation of trend, andplanning trend line, learning measures of seasonal variation time**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER III	COURSE CODE: 17ABB02	TITLE OF THE PAPER: BUSINESS STATISTICAL METHODS				HOURS:5	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5		
CO1	4	4	3	5	4	4.4	
CO2	4	5	4	4	5	4.2	
CO3	5	4	3	4	5	4.6	
CO4	5	4	5	5	4	4.6	
CO5	4	5	5	5	4	4.6	
Mean Overall Score						4.36	

Result: This Course is having **VERY HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Introduction: Collection of data – Primary data and Secondary data – Different methods of collecting primary data – Classification and Tabulation of Statistical data. Frequency distribution: Simple and Cumulative. Measures of Central value: Arithmetic Mean, Median, Mode, Geometric Mean and Harmonic Mean.

UNIT – II

Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation-Combined standard deviation and Coefficient of Variation. Measures of Skewness: Karl Pearson's and Bowley's methods.

UNIT – III

Correlation: Karl Pearson's coefficient of correlation, Spearman's rank correlation coefficient. Regression analysis: Simple regression equations.

UNIT – IV

Index numbers – Uses of index Numbers – Problems in the Construction of Index Numbers – Methods of Constructing Index Numbers – Simple Aggregative Method – Weighted Aggregative Indices – Laspeyre's, Paasche's, Bowley's and Fisher Ideal Method.

UNIT –V

Time Series – Uses and Components. Measurement of Trend: Semi-average method, Moving Average Method (problems up to 5 yearly) – Least Square Method (Fitting of straight line). Measurement of Seasonal Variation: Method of Simple Averages – Ratio-to-trend Method – Link Relative Method.

Text Books:

1. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.
2. "Statistics" by R.S.N. Pillai and V.Bagavathi (17th edition), S. Chand &Company Ltd

Reference Books:

1. "Business Statistics", Gupta. S. P., Gupta. P. K. and Manmohan.
2. " Business Statistics" – Kindle Edition by Tulsian P.C. & Jhunjhunwala ,S.Chand
3. "Index Numbers, Applied Statistics" (2nd edition), Mudgett Gupta. O. P. &Ansari. M. A., Kadarnath & Co.
4. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M.,Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.
5. "Business Statistics" (1st edition – 2008), Bharat Jhunjhunwala, S. Chand &Company Ltd.

I M. Com	QUANTITATIVE TECHNIQUES	PCM701A
SEMESTER – I		HRS/WEEK – 6
ALLIED		CREDITS – 5

OBJECTIVE :

- ✓ To apply statistical techniques for interpreting and drawing conclusion for business problems.

Course Outcomes:

At the end of the Course the students will be able to

- **CO1: Understand the concept of Probability and MathematicalExpectations**
- **CO2: Setup the hypothesis for small and large samples using in t, F and chi-square**
- **CO3: Understand the concept of Analysis of variance using CRD, RBD andLSD**
- **CO4: Understand the concept of LPP, optimal solution transportation problems using North West, Least cost and Vogel's approximation methods**
- **CO5: Understand the concept of inventory model, definition and techniques of inventory control- EOQ model**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER I	COURSE CODE: PCM701Q	TITLE OF THE PAPER: QUANTITATIVE TECHNIQUES			HOURS:6	CREDITS:5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	3	3	5	4	3.8
CO2	4	5	4	4	5	4.4
CO3	5	4	3	4	5	4.2
CO4	3	4	3	3	4	3.4
CO5	4	5	3	5	4	4.2
Mean Overall Score						4

Result: This Course is having **HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Sample Space – events – definition of Probability, Addition and Multiplications theorems – Conditional probability – Baye's theorem – Simple problems.

UNIT – II

Tests of Significance (large samples): Based on Mean and Proportions. Tests of Significance (Small Samples): t and Chi-Square tests for testing mean, variance and correlation coefficient. Chi-Square test and test for independence of attributes.

UNIT – III

Analysis of Variance: One way and two way classifications. Design of experiments: Basic principles – CRD, RBD and LSD.

UNIT – IV

LPP-feasible and optimal solutions-Graphical method, simplex methods (excluding artificial variable techniques)- simple problems only –Transportation problems -North west corner method, Least cost method and Vogel's approximation method(simple problems only)

UNIT – V

Inventory model-General concept and definitions-various cost concepts – the technique of inventory control –EOQ model.

Text Books:

1. "Fundamentals of Mathematical Statistics" (11th edition – 2002), Gupta. S. C. and Kapoor. V. K., Sultan Chand & Sons, New Delhi.
2. "Resource Management Techniques" (Operations Research)(Revised EditionJune -2009) A.R.Publications ,Chennai.

Reference Books:

1. "Fundamentals of Applied Statistics" (2nd edition – 1978), Gupta. S. C. andKapoor. V. K., Sultan Chand & Sons, New Delhi.
2. "Business Statistics" (1st edition – 2008), Bharat Jhunjhunwala, S. Chand &Company Ltd.
3. Business Statistics and Operations Research , (2009), P.R.Vittal ., Margham Publications.

II M. Sc MICROBIOLOGY	BIOSTATISTICS	EPMB911Q
III SEMESTER		HRS/WEEK – 5
ELECTIVE		CREDITS-3

OBJECTIVE:

- ✓ To apply statistical techniques for interpreting and drawing conclusion forbiological research.

Course Outcomes:

At the end of the Course the students will be able to

- **CO1: Understand the various methods of collecting Primary and Secondary data, Measures of central tendency and dispersion**
- **CO2: Understand the concept of Correlation and Regression and its uses in various fields**
- **CO3: Understand the concept of sampling and non sampling error , advantage and its disadvantages in sampling , Probability and non probability sampling methods**
- **CO4 : Setup the hypothesis for small and large samples using in t, F and chi- square**
- **CO5: Know the concept of Analysis of variance and classified into various method of CRD, RBD and LSD**

Relationship Matrix Course Outcomes and Programme Outcomes

SEMESTER III	COURSE CODE: PMB911S	TITLE OF THE PAPER: BIOSTATISTICS			HOURS:5	CREDITS:3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	
CO1	4	4	3	5	4	4.4
CO2	4	5	4	4	5	4.2
CO3	5	4	3	4	5	4.6
CO4	5	4	5	5	4	4.6
CO5	4	5	5	5	4	4.6
Mean Overall Score						4.36

Result: This Course is having **VERY HIGH** association with Programme Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT – I

Collection of data: Primary data and Secondary data – meaning – Data collection methods. Measures of central tendency: Arithmetic Mean, Median, Mode. Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation and Coefficient of Variation.

UNIT – II

Correlation analysis: Karl Pearson's, Spearman's rank and Concurrent deviation methods. Regression Analysis: Simple regression equations.

UNIT – III

Sampling theory: types of sampling – Sampling and non sampling error and Advantages and disadvantages in sampling – probability and non-probability sampling methods.

UNIT – IV

Concept of Sampling distributions – Standard Error – Tests of Significance based on t, Chi –Square and F distributions with respect of Mean, Variance and Correlation coefficient. Large sample tests based on Proportions, Mean, Variance and Correlation coefficient.

UNIT – V

Analysis of Variance – One way and two way classifications. Basic principles of design of experiments: Randomization, Replication and Local Control – CRD, RBD and LSD.

Text Books:

1. "Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi.
2. "Fundamentals of Applied Statistics" (2nd edition – 1978), Gupta. S. C. andKapoor. V. K., Sultan Chand & Sons, New Delhi.
3. "Fundamentals of Mathematical Statistics" (11th edition – 2002), Gupta. S. C. and Kapoor. V. K., Sultan Chand & Sons, New Delhi.

Reference Books:

1. "Statistics (Theory and Practice)" (3rd edition - 1993), Pillai. R. S. N. and Bagavathi. V. Sultan Chand & Sons, New Delhi.
2. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M.,Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.
3. "Mathematical Statistics" (1st edition – 2002), Vittal. P. R., MarghamPublications, Chennai – 17.

MODEL FOR END SEMESTER QUESTION PAPER

UG QUESTION PAPER PATTERN

The following procedure may be followed for the end semester question paper.

Part – A

Answer **all** the questions (10×2=20)

Part – B

Answer **all** the questions (Internal choice, i.e., either or) (5×5=25)

Part – C

Answer any **three** questions (3×10=30) (5 questions may be given)

A question paper must contain 80% problems and 20% theory.

All the units must be occurred in each section.

It should be seen that the average student can easily complete the paper within 3 hours and should be able to pass. The question paper should be neither too easy nor too tough.

PG QUESTION PAPER PATTERN

The following procedure may be followed for the end semester question paper.

Part – A

Answer **all** the questions (Internal choice, i.e., either or) (5×6=30)

Part – B

Answer any **three** questions (3×15=45) (5 questions may be given)

A question paper must contain 80% problems and 20% theory.

All the units must be occurred in each section.

It should be seen that the average student can easily complete the paper within 3 hours and should be able to pass. The question paper should be neither too easy nor too tough.

VALUE ADDEDCOURSE	STATISTICAL ANALYSIS USING EXCEL DATA SHEET For the students admitted from the year 2018	VAST01
		HOURS –30

OBJECTIVES

- To create working knowledge with EXCEL
- To acquire skills in creating data base files and their manipulation usingEXCEL data sheet
- Ability to work and analyze with statistical technical tools interpreterwith EXCEL data sheet

UNIT – I GRAPHICAL REPRESENTATION

Construction of frequency distribution table for raw data. Graphical representation of data - Simple bar diagram, Multiple bar diagram, Pie chart, Histogram.

UNIT – II MEASURES OF CENTRAL TENDENCY

Measure of central tendency – Arithmetic Mean, Median and Mode. Measures of Dispersion – Range, Variance, Standard Deviation. Skewness and Kurtosis.

UNIT – III CORRELATION

Karl Pearson's coefficient of Correlation.

UNIT – IV REGRESSION

Estimating Regression equations - prediction of variables.

UNIT – V DESIGN OF EXPERIMENTS

One way classification - Two way classifications.

REFERENCES

1. Statistical analysis with excel for dummies, (2nd edition- 2009), JosephSchmuller. Wiley Publishing inc., Canada.
2. Statistical analysis Microsoft Excel 2000, Conrad Carlberg . PearsonEducation Inc., USA.
3. "Statistics (Theory and Practice)" (3rd edition - 1993), Pillai. R. S. N. and Bagavathi. V. Sultan Chand & Sons, New Delhi.
4. "Fundamentals of Statistics – Volume II" (6th edition - 1990), Goon. A. M.,Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.

VALUE ADDED COURSE	BIOSTATISTICS For the students admittedfrom the year 2019	VAST02
		HOURS –30

OBJECTIVES

- To apply statistical techniques for interpreting and drawing conclusionfor biological research.

- Ability to work and analyze with statistical technical tools with EXCELdata sheet

UNIT – I

One dimensional diagram – Simple bar diagram, Subdivided bar diagram,Multiple bar diagram and Percentage bar diagram.

UNIT – II

Two dimensional diagrams – Pie diagram. Graphs of frequency distribution-Histogram, Frequency polygon and Frequency curve.

UNIT – III

Measure of central tendency – Arithmetic Mean, Median and Mode.

UNIT – IV

Measures of Dispersion – Range, Variance, Standard Deviation.

UNIT – V

Karl Pearson's coefficient of Correlation.

REFERENCES

1. Statistical Methods" (32nd edition - 2004), Gupta. S. P., Sultan Chand &Sons, New Delhi

2. Statistical analysis Microsoft Excel 2000, Conrad Carlberg . Pearson Education Inc., USA.