



UNIVERSITY OF CALICUT

Abstract

General and Academic - Faculty of Science - Scheme and Syllabus of BSc Statistics Programme under CBCSS UG Regulations 2019 with effect from 2019 Admission onwards - Implemented- Orders Issued

G & A - IV - J

U.O.No. 8618/2019/Admn

Dated, Calicut University.P.O, 02.07.2019

*Read:-*1. U.O.No. 4368/2019/Admn dated 23.03.2019

2. Item No. 1 of the minutes of the meeting of the Board of Studies in Statistics UG held on 15.05.2019

3. Item No.1.24 of the minutes of the meeting of Faculty of Science held on 27.06.2019

ORDER

The Regulations for Choice Based Credit and Semester System for Under Graduate (UG) Curriculum-2019 (CBCSS UG Regulations 2019) for all UG Programmes under CBCSS-Regular and SDE/Private Registration w.e.f. 2019 admission has been implemented vide paper read first above .

The meeting of Board of Studies in Statistics UG held on 15/05/2019 has approved the Syllabus of B Sc Statistics Programme in tune with the new CBCSS UG Regulation with effect from 2019 Admission onwards, vide paper read second above.

The Faculty of Science at its meeting held on 27/06/2019 has approved the minutes of the meeting of the Board of Studies in Statistics UG held on 15/05/2019, vide paper read third above.

Under these circumstances , considering the urgency, the Vice Chancellor has accorded sanction to implement the Scheme and Syllabus of B Sc Statistics Programme in accordance with new CBCSS UG Regulations 2019, in the University with effect from 2019 Admission onwards, subject to ratification by the Academic Council.

Sanction is therefore accorded for implementing the Scheme and Syllabus of B Sc Statistics Programme in accordance with CBCSS UG Regulations 2019, in the University with effect from 2019 Admission onwards.

Orders are issued accordingly. (Syllabus appended)

Biju George K

Assistant Registrar

To

1.The Principals of all Affiliated Colleges 2. Director, SDE

Copy to: PS to VC/PA to PVC/ PA to Registrar/PA to CE/JCE I/JCE IV/JCE VIII/EX IV and EG Sections/GA I F/CHMK Library/Information Centres/SF/DF/FC

Forwarded / By Order

Section Officer

STATISTICS: COMPLEMENTARY
SYLLABUS FOR B.Sc. (MATHEMATICS MAIN)
CBCSSUG 2019 (2019 admission onwards)

Sem No	Course Code	Course Title	Instructional Hours/week	Credit	Exam Hours	Ratio Ext: Int
1	STA 1C 01	INTRODUCTORY STATISTICS	4	3	2	4:1
2	STA 2C 02	PROBABILITY THEORY	4	3	2	4:1
3	STA 3C 03	PROBABILITY DISTRIBUTIONS AND SAMPLING THEORY	5	3	2	4:1
4	STA 4C 04	STATISTICAL INFERENCE AND QUALITY CONTROL	5	3	2	4:1

Question Paper Pattern

Question number (From..... To	Type of Questions and Marks
01 to 12	Short answer type carries 2 marks each - 12 questions (Maximum Marks 20)
13 to 19	Paragraph/ Problem type carries 5 marks each – 7 questions (Maximum Marks 30)
20 to 21	Essay type carries 10 marks (1 out of 2) (Maximum Mark 10)
01 to 21	Total Marks: 60

SEMESTER I

STA 1C 01- INTRODUCTORY STATISTICS

Contact Hours per week: 4

Number of credits: 3

Number of Contact Hours: 72

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

Blue Print for Question Paper Setting / Scrutiny							
Max. Marks: 60							
Question Paper			Syllabus				
Section s or Parts	Mark	Question Number s	MODULE 1	MODULE 2	MODULE 3	MODULE 4	
			7 Hrs 7 Marks	30 Hrs 30 Marks	15 Hrs 19Marks	20 Hrs 21 Marks	
Expected mark >>>>							
A	2	1	2				
		2		2			
		3		2			
		4		2			
		5		2			
		6		2			
		7		2			
		8				2	
		9				2	
		10					2
		11					2
		12					2
B	5	13	5				
		14		5			
		15		5			
		16			5		
		17			5		
		18			5		
		19				5	
C	10	20		10			
		21				10	
Actual Mark >>>>			7	32	19	21	

Question Paper setter has to give equal importance to both theory and problems in section B and C.

I. INTRODUCTORY STATISTICS (CODE: STA1C01)

Module 1: *Official statistics:* The Statistical system in India: The Central and State Government organizations, functions of the Central Statistical Office (CSO), National Sample Survey Organization (NSSO) and the Department of Economics and Statistics.

7 hours

Module 2: *Introduction to Statistics:* Nature of Statistics, Uses of Statistics, Statistics in relation to other disciplines, Abuses of Statistics. Concept of primary and secondary data. Designing a questionnaire and a schedule. Concepts of statistical population and sample from a population, quantitative and qualitative data, Nominal, ordinal and time series data, discrete and continuous data. Presentation of data by table and by diagrams, frequency distributions by histogram and frequency polygon, cumulative frequency distributions (inclusive and exclusive methods) and ogives. Measures of central tendency (mean, median, mode, geometric mean and harmonic mean) with simple applications. Absolute and relative measures of dispersion (range, quartile deviation, mean deviation and standard deviation) with simple applications. Co-efficient of variation, Box Plot. Importance of moments, central and non-central moments, and their interrelationships. Measures of skewness based on quartiles and moments; kurtosis based on moments.

30 hours

Module 3: *Correlation and Regression:* Scatter Plot, Simple correlation, Simple regression, two regression lines, regression coefficients. Fitting of straight line, parabola, exponential, polynomial (least square method).

15 hours

Module 4: *Time series:* Introduction and examples of time series from various fields, Components of times series, Additive and Multiplicative models. Trend: Estimation of trend by free hand curve method, method of semi averages, method of moving averages and fitting various mathematical curves. Seasonal Component: Estimation of seasonal component by Method of simple averages, Ratio to Trend.

Index numbers: Definition, construction of index numbers and problems thereof for weighted and unweighted index numbers including Laspeyre's, Paasche's, Edgeworth-Marshall and Fisher's.

20 hours

References:

1. S.C. Gupta and V.K. Kapoor. *Fundamentals of Mathematical Statistics*, Sultan Chand & Sons, New Delhi
2. Goon A.M., Gupta M.K. and Dasgupta B. (2002): *Fundamentals of Statistics*, Vol. I & II, 8th Edn. The World Press, Kolkata.
3. Mukhopadhyay P. (2011): *Applied Statistics*, 2nded. Revised reprint, Books and Allied
4. Hoel P.G. *Introduction to mathematical statistics*, Asia Publishing house.
5. Chatfield.C. *The Analysis of Time Series: An Introduction*, Chapman & Hall
6. *Guide to current Indian Official Statistics*, Central Statistical Office, GOI, New Delhi.
7. www.mospi.gov.in
8. www.ecostat.kerala.gov.in

SEMESTER II

STA 2C 02- PROBABILITY THEORY

Contact Hours per week: 4

Number of credits: 3

Number of Contact Hours: 72

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

Blue Print for Question Paper Setting / Scrutiny							
Max. Marks: 60							
Question Paper			Syllabus				
Section s or Parts	Mark	Question Number s	MODULE 1	MODULE 2	MODULE 3	MODULE 4	
			25Hrs 28 Marks	12Hrs 16 Marks	15 Hrs 16 Marks	20 Hrs 19 Marks	
Expected mark >>>>							
A	2	1	2				
		2	2				
		3	2				
		4	2				
		5		2			
		6		2			
		7		2			
		8				2	
		9				2	
		10				2	
							2
							2
B	5	13	5				
		14	5				
		15		5			
		16		5			
		17			5		
		18			5		
		19				5	
C	10	20	10				
		21				10	
Actual Mark >>>>			28	16	16	19	

Question Paper setter has to give equal importance to both theory and problems in section B and C.

II. PROBABILITY THEORY (CODE: STA2C02)

Module 1: *Introduction to Probability:* Random experiment, Sample space, events, classical definition of probability, statistical regularity, field, sigma field, axiomatic definition of probability and simple properties, addition theorem (two and three events), conditional probability of two events, multiplication theorem, independence of events-pair wise and mutual, Bayes theorem and its applications.

25 hour

Module 2: *Random variables:* Discrete and continuous, probability mass function (pmf) and probability density function (pdf)-properties and examples, Cumulative distribution function and its properties, change of variables (univariate case only)

12 hours

Module 3: *Mathematical expectations (univariate):* Definition, raw and central moments (definition and relationships), moment generation function and properties, characteristic function (definition and use only), Skewness and kurtosis using moments

15 hours

Module 4: *Bivariate random variables:* Joint pmf and joint pdf, marginal and conditional probability, independence of random variables, function of random variable. Bivariate Expectations, conditional mean and variance, covariance, Karl Pearson Correlation coefficient, independence of random variables based on expectation.

20 hours

References :

1. Rohatgi V. K. and Saleh, A.K. Md. E. (2009): An Introduction to Probability and Statistics. 2ndEdn. (Reprint) John Wiley and Sons.
2. S.C.Gupta and V. K. Kapoor, *Fundamentals of Mathematical Statistics*, Sultan Chand and Sons.
3. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn., (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
4. John E Freund, *Mathematical Statistics*, Pearson Edn, New Delhi
5. Hoel P.G. *Introduction to mathematical statistics*, Asia Publishing house.

SEMESTER III

STA 3C 03- PROBABILITY DISTRIBUTIONS AND SAMPLING THEORY

Contact Hours per week: 4

Number of credits: 3

Number of Contact Hours: 90

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

Blue Print for Question Paper Setting / Scrutiny						
Max. Marks: 80						
Question Paper			Syllabus			
Section s or Parts	Mark	Question Number s	MODULE 1	MODULE 2	MODULE 3	MODULE 4
			30Hrs	25Hrs	10Hrs	25 Hrs
			28 Marks	21 Marks	9 Marks	21 Marks
Expected mark >>>>						
A	2	1	2			
		2	2			
		3	2			
		4	2			
		5		2		
		6		2		
		7		2		
		8			2	
		9			2	
		10				2
		11				2
		12				2
B	5	13	5			
		14	5			
		15		5		
		16		5		
		17		5		
		18			5	
		19				5
C	10	20	10			
		21				10
Actual Mark >>>>			28	21	9	21

Question Paper setter has to give equal importance to both theory and problems in section B and C.

III. PROBABILITY DISTRIBUTIONS AND SAMPLING THEORY. (CODE:STA3C03)

Module 1: *Standard distributions:* Discrete type-Bernoulli, Binomial, Poisson, Geometric, Negative Binomial (definition only), Uniform (mean, variance and mgf). Continuous type-Uniform, exponential and Normal (definition, properties and applications); Gamma (mean, variance, mgf); Lognormal, Beta, Pareto and Cauchy (Definition only)

30 hours

Module 2: *Limit theorems:* Chebyshev's inequality, Sequence of random variables, parameter and Statistic, Sample mean and variance, Convergence in probability (definition and example only), weak law of large numbers (iid case), Bernoulli law of large numbers, Convergence indistribution (definition and examples only), Central limit theorem (Lindberg levy-iid case)

25 hours

Module 3: Sampling methods: Simple random sampling with and without replacement, systematic sampling (Concept only), stratified sampling (Concept only), Cluster sampling(Concept only)

10 hours

Module 4: Sampling distributions: Statistic, Standard error, Sampling from normal distribution, distribution of sample mean, sample variance, chi-square distribution, t-distribution, and F distribution (definition, derivations and relationships only).

25 hours

References:

1. Rohatgi V. K. and Saleh, A.K. Md. E. (2009): An Introduction to Probability and Statistics. 2ndEdn. (Reprint) John Wiley and Sons.
2. S.C.Gupta and V. K. Kapoor, *Fundamentals of Mathematical Statistics*, Sultan Chand and Sons.
3. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn., (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
4. John E Freund, *Mathematical Statistics*, Pearson Edn, NewDelhi
5. Cochran W.G. (1984):Sampling Techniques(3rdEd.), Wiley Eastern.

SEMESTER IV

STA 4C 04 - STATISTICAL INFERENCE AND QUALITY CONTROL

Contact Hours per week: 4

Number of credits: 3

Number of Contact Hours: 90

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

Blue Print for Question Paper Setting / Scrutiny							
Max. Marks: 60							
Question Paper			Syllabus				
Section s or Parts	Mark	Question Number s	MODULE 1	MODULE 2	MODULE 3	MODULE 4	
			30 Hrs 26 Marks	35 Hrs 30Marks	10 Hrs 9 Marks	15Hrs 14 Marks	
Expected mark >>>>							
A	2	1	2				
		2	2				
		3	2				
		4		2			
		5		2			
		6		2			
		7		2			
		8		2			
		9				2	
		10				2	
		11					2
		12					2
B	5	13	5				
		14	5				
		15		5			
		16		5			
		17			5		
		18				5	
		19				5	
C	10	20	10				
		21		10			
Actual Mark >>>>			26	30	9	14	

Question Paper setter has to give equal importance to both theory and problems in section B and C.

**IV: STATISTICAL INFERENCE AND QUALITY CONTROL.
(CODE: STA4C04)**

Module 1: Estimation theory: Parametric space, sample space, point estimation. Neyman Factorization criteria, Requirements of good estimator: Unbiasedness, Consistency, Efficiency, Sufficiency and completeness. Minimum variance unbiased (MVU) estimators. Cramer-Rao inequality (definition only). Minimum Variance Bound (MVB) estimators. Methods of estimation: Maximum likelihood estimation and Moment estimation methods (Detailed discussion with problems); Properties of maximum likelihood estimators (without proof); Least squares and minimum variance (concepts only). Interval estimation: Confidence interval (CI); CI for mean and variance of Normal distribution; Confidence interval for binomial proportion and population correlation coefficient when population is normal.

30 hours

Module 2: Testing of Hypothesis: Level of significance, Null and Alternative hypotheses, simple and composite hypothesis, Types of Errors, Critical Region, Level of Significance, Power and p-values. Most powerful tests, Neyman-Pearson Lemma (without proof), Uniformly Most powerful tests. Large sample tests: Test for single mean, equality of two means, Test for single proportion, equality of two proportions. Small sample tests: t-test for single mean, unpaired and paired t-test. Chi-square test for equality of variances, goodness of fit, test of independence and association of attributes. Testing means of several populations: One Way ANOVA, Two Way ANOVA (assumptions, hypothesis, ANOVA table and problems)

35 hours

Module 3: Non-parametric methods: Advantages and drawbacks; Test for randomness, Median test, Sign test, Mann-Whitney U test and Wilcoxon test; Kruskal Wallis test (Concept only)

10 hours

Module 4: Quality Control: General theory of control charts, causes of variations in quality, control limits, sub-grouping, summary of out-of-control criteria. Charts of variables - X bar chart, R Chart and sigma chart. Charts of attributes – c-charts, p-chart and np-chart.(Concepts and problems).

15 hours

References:

1. Rohatgi V. K. and Saleh, A.K. Md. E. (2009): An Introduction to Probability and Statistics. 2ndEdn. (Reprint) John Wiley and Sons.
2. Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons: New Delhi.
3. S.C.Gupta and V. K. Kapoor, *Fundamentals of Mathematical Statistics*, Sultan Chand and Sons
4. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rdEdn., (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
5. John E Freund, *Mathematical Statistics*, Pearson Edn, NewDelhi
6. Grant E L, *Statistical quality control*, McGraw Hill
7. Montgomery, D. C. (2009): Introduction to Statistical Quality Control, 6th Edition, Wiley India Pvt. Ltd.

STATISTICS: COMPLEMENTARY Syllabus for B.Sc.

CBCSSUG 2019 (2019 admission onwards)

SYLLABUS FOR B.Sc. (PSYCHOLOGY MAIN)

Sem No	Course Code	Course Title	Instructional Hours/week	Credit	Exam Hours	Ratio Ext: Int
1	STA 1C 02	DESCRIPTIVE STATISTICS	4	3	2	4:1
2	STA 2C 02	REGRESSION ANALYSIS AND PROBABILITY THEORY	4	3	2	4:1
3	STA 3C 02	PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS	5	3	2	4:1
4	STA 4C 02	STATISTICAL TECHNIQUES FOR PSYCHOLOGY	5	3	2	4:1

SEMESTER I

STA 1C 02- DESCRIPTIVE STATISTICS

Contract Hours per week: 4

Number of credits: 3

Number of Contact Hours: 72

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

Question Paper Pattern

Type of Questions	Question number (From..... To	Marks
Short Answer	01 to 12	Short answer type carries 2 marks each - 12 questions (Maximum Marks 20)
Paragraph/ Problems	13 to 19	Paragraph/ Problem type carries 5 marks each – 7 questions (Maximum Marks 30)
Essay	20 to 21	Essay type carries 10 marks (1 out of 2) (Maximum Marks 10)
Total	01 to 21	60

Question Paper setter has to give equal importance to both theory and problems in sections B and C.

Objectives

1. To generate interest in Statistics
2. To equip the students with the concepts of basic Statistics
3. To provide basic knowledge about Statistical methods

Module 1: *A basic idea about data-* collection of data, primary and secondary data, organization, planning of survey and diagrammatic representation of data

10

Hours

Module 2: *Classification and tabulation-* Classification of data, frequency distribution, formation of a frequency distribution, Graphic representation viz. Histogram, Frequency Curve, Polygon, Ogives, Bar diagram and Pie diagram

10

Hours

Module 3: *Measure of central tendency-* Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean, Combined Mean, Advantages and disadvantages of each average

20

Hours

Module 4: Measures of dispersion- Range, Quartile Deviation, Mean Deviation, Standard Deviation, Combined Standard Deviation, Percentiles, Deciles, Relative Measures of Dispersion, Coefficient of variation

16

Hours

Module 5: Skewness and Kurtosis- Pearson’s and Bowley’s coefficient of skewness, Percentile Measure of Kurtosis

16

Hours

References

1. Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons: New Delhi.
2. Gupta, S.C., & Kapoor, V.K. *Fundamentals of Applied Statistics*. New Delhi: Sultan Chand and Sons.
3. Garret, H.E., &Woodworth, R.S. *Statistics in Psychology and Education*. Bombay: Vakila, Feffex and Simens Ltd.
4. Mood, A.M., Graybill, F.A and Boes, D.C. *Introduction to Theory of Statistics*. 3rd Edition Paperback – International Edition.
5. Mukhopadhyay,P. *Mathematical Statistics*. New central Book Agency (P) Ltd: Calcutta.

Assignments/ Seminar

Assignments/Seminar are to be given to students. The purpose of the assignments/seminar is to provide practical exposure to the students.

SEMESTER II

STA 2C 02- REGRESSION ANALYSIS AND PROBABILITY THEORY

Contract Hours per week: 4

Number of credits: 3

Number of Contact Hours: 72

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

Question Paper Pattern

Type of Questions	Question number (From..... To	Marks
Short Answer	01 to 12	Short answer type carries 2 marks each - 12 questions (Maximum Marks 20)
Paragraph/ Problems	13 to 19	Paragraph/ Problem type carries 5 marks each – 7 questions (Maximum Marks 30)
Essay	20 to 21	Essay type carries 10 marks (1 out of 2) (Maximum Marks 10)
Total	01 to 21	60

Question Paper setter has to give equal importance to both theory and problems in sections B and C.

Objectives

1. To make the students aware of various Statistical tools
2. To create awareness about probability

Module 1: *Bivariate data*- relationship of variables, correlation analysis, methods of studying correlation, Scatter Diagram, Karl Pearson's Coefficient of Correlation, Calculation of Correlation from a 2-way table, Interpretation of Correlation Coefficient, Rank Correlation

11

Hours

Module 2: *Regression analysis*- linear regression, Regression Equation, Identifying the Regression Lines properties of regression coefficients, numerical problems

9

Hours

Module 3: *Partial and Multiple Correlation Coefficients*- Multiple Regression Equation, Interpretation of Multiple Regression Coefficients (three variable cases only)

16

Hours

Module 4: *Basic probability*- Sets, Union, Intersection, Complement of Sets, Sample Space, Events, Classical, Frequency and Axiomatic Approaches to Probability, Addition and Multiplication Theorems, Independence of Events (Up-to three events)

20

Hours

Module 5: *Random Variables and their probability distributions*- Discrete and Continuous Random Variables, Probability Mass Function, Distribution Function of a Discrete Random Variable

16

Hours

References

1. Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons: New Delhi.
2. Gupta, S.C., & Kapoor, V.K. *Fundamentals of Applied Statistics*. New Delhi: Sultan Chand and Sons.
3. Garret, H.E., & Woodworth, R.S. *Statistics in Psychology and Education*. Bombay: Vakila, Feffex and Simens Ltd.
4. Mood, A.M., Graybill, F.A and Boes, D.C. *Introduction to Theory of Statistics*. 3rd Edition Paperback – International Edition.
5. Mukhopadhyay, P. *Mathematical Statistics*. New central Book Agency (P) Ltd: Calcutta.

Assignments/ Seminar

Assignments/Seminar are to be given to students. The purpose of the assignments/seminar is to provide practical exposure to the students.

SEMESTER III

STA 3C 02- PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS

Contract Hours per week: 5

Number of credits: 3

Number of Contact Hours: 90

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

Question Paper Pattern

Type of Questions	Question number (From..... To	Marks
Short Answer	01 to 12	Short answer type carries 2 marks each - 12 questions (Maximum Marks 20)
Paragraph/ Problems	13 to 19	Paragraph/ Problem type carries 5 marks each – 7 questions (Maximum Marks 30)
Essay	20 to 21	Essay type carries 10 marks (1 out of 2) (Maximum Marks 10)
Total	01 to 21	60

Question Paper setter has to give equal importance to both theory and problems in sections B and C.

Objectives

1. To get a general understanding on various probability distributions
2. To familiarize the uses of Statistical test.

Module 1: *Distribution Theory-* Binomial, Poisson and Normal Distributions, Mean and Variance (without derivations), Numerical Problems, Fitting, Importance of Normal Distribution, standard normal distribution, simple problems using standard normal tables, Central Limit Theorem (Concepts only)

25

Hours

Module2: *Methods of Sampling-* Random Sampling, Simple Random Sampling, Stratified, Systematic and Cluster Sampling, Non Random

sampling, Subjective sampling, Judgment sampling and convenience sampling

20

Hours

Module 3: *Fundamentals of Testing*- Type-I & Type-II Errors, Critical Region, Level of Significance, Power, p value, Tests of Significance

15

Hours

Module 4: *Large Sample Tests* – Test of a Single, Mean Equality of Two Means, Test of a Single Proportion, and Equality of Two Proportions

10

Hours

Module 5: *Small Sample tests*-Test of a Single Mean, Paired and Unpaired t-Test, Chi-Square Test of Variance, F-Test for the Equality of Variance, Tests of Correlation

20

Hours

References

1. Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons: New Delhi.
2. Gupta, S.C., & Kapoor, V.K. *Fundamentals of Applied Statistics*. New Delhi: Sultan Chand and Sons.
3. Garret, H.E., & Woodworth, R.S. *Statistics in Psychology and Education*. Bombay: Vakila, Feffex and Simens Ltd.
4. Mood, A.M., Graybill, F.A and Boes, D.C. *Introduction to Theory of Statistics*. 3rd Edition Paperback – International Edition.
5. Mukhopadhyay, P. *Mathematical Statistics*. New central Book Agency (P) Ltd: Calcutta.

Assignments/ Seminar

Assignments/Seminar are to be given to students. The purpose of the assignments/seminar is to provide practical exposure to the students.

SEMESTER IV

STA 4C 02- STATISTICAL TECHNIQUES FOR PSYCHOLOGY

Contract Hours per week: 5

Number of credits: 3

Number of Contact Hours: 90

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

Question Paper Pattern

Type of Questions	Question number (From..... To	Marks
Short Answer	01 to 12	Short answer type carries 2 marks each - 12 questions (Maximum Marks 20)

Paragraph/ Problems	13 to 19	Paragraph/ Problem type carries 5 marks each – 7 questions (Maximum Marks 30)
Essay	20 to 21	Essay type carries 10 marks (1 out of 2) (Maximum Marks 10)
Total	01 to 21	60

Question Paper setter has to give equal importance to both theory and problems in sections B and C.

Objectives

1. To make the students aware of various Statistical test in different areas of Psychology
2. To give knowledge about applications of Statistics in different areas of Psychological studies.

Module 1: *Analysis of Variance*- assumptions, One-way and Two-way Classification with Single Observation per Cell, Critical Difference

20

Hours

Module 2: *Non Parametric tests*- Chi-square Test of Goodness of Fit, Test of Independence of Attributes, Test of Homogeneity of Proportions

20

Hours

Module 3: *Sign Test*- Wilcoxon's Signed Rank Test, Wilcoxon's Rank Sum Test, Run Test and Krushkal-Wallis Test

20

Hours

Module 4: *Factorial Design*- Basics of factorial Design, Factorial experiments and their uses in Psychological studies, Concepts of 2^2 , 2^3 factorial experiments (without derivation), simple problems

15

Hours

Module 5: *Preparation of Questionnaire*- Scores and Scales of Measurement, Reliability and Validity of Test Scores

15

Hours

References

1. Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons: New Delhi.
2. Gupta, S.C., & Kapoor, V.K. *Fundamentals of Applied Statistics*. New Delhi: Sultan Chand and Sons.
3. Garret, H.E., & Woodworth, R.S. *Statistics in Psychology and Education*. Bombay: Vakila, Feffex and Simens Ltd.
4. Mood, A.M., Graybill, F.A and Boes, D.C. *Introduction to Theory of Statistics*. 3rd Edition Paperback – International Edition.

5. [Douglas C. Montgomery](#). *Design and Analysis of Experiments*. 9th Edition.

Assignments/ Seminar

Assignments/Seminar are to be given to students. The purpose of the assignments/seminar is to provide practical exposure to the students.