

**Board of Studies Report
2026-27**

**Department of Statistics
Smt. N. P. S Govt. Degree College for Women
(Autonomous)
Chittoor
(Accredited with A Grade)**

B.Sc. – Statistics Minor

Academic Cell, Smt. N.P.S. Govt. College for Women (A), Chittoor

Proceedings of the Principal, Smt. N.P.S. Govt. College for Women (A), Chittoor

Present: Dr. K. Manohar

Rc.No.CS01 /NPSWDC/UG-BOS/2026-27 dt.

Subject: Smt. N.P.S. Govt. College for Women (A), Chittoor - UG Board of Studies (BoS) - Nomination of Members Orders issued.

Ref.: 1. UGC Guidelines of for Autonomous Colleges -2023.

2. Proc. Of the VC No: SVU/C-III (3)/BOS/Smt. N.P.S. Govt. College for Women (A)/CTR/2026 dt.

Order

The Principal, Smt. N.P.S. Govt. College for Women (A), Chittoor, is pleased to nominate the following members to UG Board of Studies to frame the syllabus of Statistics courses in all these mesters duly following the norms of the UGC regulations for the Autonomous Colleges 2023.

S.No	Name	Designation
1	Dr. Kousar Jaha Begum	Chairperson
2	Dr. P. Devendran	Member
3	Dr. P. Maheswari	University Nominee
4	Dr. T. Gangaram	Local Nominee
5	Dr. V. Munaiah	Local Nominee
6	Mr. Bharath Raja Jonnalagadda	Industrial Nominee
7	Kum. P. Gamyra	Alumni Student
8	Dr. K. Sreenivasulu	Subject/ Special Course Expert

The above members are requested to attend the BoS meetings for the first Autonomous UG-Batch 2026-27 and share their valuable views, suggestions on the following functionaries.

- Prepare syllabi for the subject keeping in view the objectives of the college, interest of the stakeholders and National recruitment for consideration and approval of the IQAC and Academic Cell.
- Suggest methodologies for innovative teaching and evaluation techniques
- Suggest the panel of names to the Academic council for appointment of Examiners
- Coordinate research, teaching, extension and other activities in the department of the College.
- Suggest CLO, PLO and subject experts to develop question bank in compliance with Bloom's Taxonomy.

The above said members are requested to bestow their services for the successful organization of the events whenever scheduled.

Principal

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DEPARTMENT OF STATISTICS

COMPOSITION OF BOARD OF STUDIES FOR THE YEAR 2026-27

S.No	Category	Name & Designation	Chairperson / Member
1.	Chairperson	Dr. Kousar Jaha Begum Asst. Professor	Ph: 9985312244 Mail: begum.kousar123@gmail.com
2.	Member	Dr. P. Devendran Sr. Lecturer	Mobile: 8328593747 Email:devendran21stat@gmail.com
3.	University Nominee	Dr. P. Maheswari Asst. Professor	Mobile: 9000089977 E-mail: Pmsstats77@gmail.com
4.	Local Nominee	Dr. T. Gangaram Asst. Professor GDC(W), Srikalahasti	Mobile: 7670825232 E-mail: theerthamgangarams@gmail.com
5.	Local Nominee	Dr. V. Munaiah Asst. Professor GDC(W), Srikalahasti	Mobile: 9248525294 E-mail:drvmstats@gmail.com
6.	Industrial Nominee	Mr. Bharath Raja Jonnalagadda	Ph: 9666401936 Mail:jonnabharathraja212@gmail.com
7.	Alumni Student	Kum. P. Gamyra	Ph: 9963762785 Mail:pgamyra12@gmail.com
8.	Subject/ Special Course Expert	Dr. K. Sreenivasulu Asst. Professor DKW Degree College, Nellore	Ph: 9948870696 Mail:ksreenivasulu.70@gmail.com

Signature of the Members

Signature of the BOS Chairman

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Department of Statistics

Board of Studies Dated:

Meeting of the Board of studies is held at Computer Laboratory for the Department of Statistics, Smt. N.P.S. Govt. College for Women(A), Chittoor with the following agenda.

Agenda

- Curriculum Design for III Semester for B.Sc.(Honors)-Statistics (Minor)
- Designing of Course Outcomes and Course Objectives
- Identifying/inclusion components of Skill development, employability and Entrepreneurship in the curriculum
- Additional inputs in to the curriculum
- Designing Model Question Papers and identifying potential paper setters
- Innovative Teaching–Learning Methodology(Learner Centric)
- Curriculum for the Certificate Courses
- Academic activities of the Department
- Any other proposal with the permission of the chair person

Dr. Kousar Jaha Begum

Chair Person Board of Studies

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Statistics (Minor) in Curriculum frame work w.e.f. AY 2026-27

Minutes and Resolutions

The BOS Team have given the following inputs on the BOS Meeting-1:

- Changes required in the framed syllabus of the course-1 "Descriptive Statistics" in Semester-III".
- Appropriate changes were made or incorporated in course-1.
- In the Semester-VI "Theory of Probability and Mathematical Expectations" as required and emphasized in further courses later.
- Appropriate changes were made or incorporated in the MDC courses "Basic Statistics" in Semester-IV for the benefit of all groups of students.

The above suggestions are agreed by all the BOS members also incorporated while framing the UG syllabus for the B.Sc., Statistics (Minor) and Basic Statistics related MDC courses for all groups during Second year. The approved syllabus is followed from A.Y.2026-27.

Signature of the Members

Signature of the BOS Chairman

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CONSOLIDATEDREPORTOFBOARDOFSTUDIESFORTHEYEAR 2026-27

The Meeting Board of Studies of Statistics & Applications department was conducted on Under the Chairmanship of Dr. Kousar Jaha Begum Head/ Lecturer-in-charge of Department of Statistics. The following members are present

S.No.	Name	Designation	Signature
1	Dr. Kousar Jaha Begum	Chairperson	
2	Dr. P. Devendran	Member	
3	Dr. P. Maheswari	University Nominee	
4	Dr. T. Gangaram	Local Nominee	
5	Dr. V. Munaiah	Local Nominee	
6	Mr. Bharath Raja Jonnalagadda	Industrial Nominee	
7	Kum. P. Gamy	Alumni Student	
8	Dr. K. Sreenivasulu	Subject/ Special Course Expert	

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Board of Studies Meeting on _____

DEPARTMENT OF STATISTICS

LIST OF PAPER SETTERS

SNo	Name of the Lecturer/Reader/Professor	Papers	Qualification	College – City
1	Dr. P. Maheswari Lecturer in Statistics	ALL	M.Sc.,Ph.d	Govt. Degree College , Nagari
2	Dr. T. Gangaram Lecturer in Statistics	ALL	M.Sc.,Ph.d	Govt. Degree College for women, Srikalahasthi.
3	Dr. V. Munaiah Lecturer in Statistics	ALL	M.Sc.,Ph.d	Govt. Degree College for women, Srikalahasthi.
4	Dr. K. Sreenivasulu	ALL	M.Sc.,Ph.d	DKW Degree College, Nellore
5	Dr. G. Varalakshmi Lecturer in Statistics	ALL	M.Sc.,Ph.d	PRR & VS Govt. Degree College, Vidavalur.
6	Smt. N. Nagasyamala Lecturer in Statistics	ALL	M.Sc	D.K. Government College for women, Nellore
7	Smt. N.Jayanthi Lecturer in Statistics	ALL	M,Sc	D.K. Government College for women, Nellore
8	Sri. S. Hari Prasad Lecturer in Statistics	ALL	M.Sc	P.V.K.N Govt. Degree College(A), Chittoor
9	Sri. S. Chandra Babu Lecturer in Statistics	ALL	M.Sc	P.V.K.N Govt. Degree College(A), Chittoor

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DEPARTMENT OF STATISTICS

SCHEME OF EVALUATION

MODEL OF SEMESTER END EXAMINATION QUESTION PAPER
(THEORY)

(As Approved in the BOS meeting held on _____)

EVALUATION SCHEME

Standard Operating Procedure for Continuous Internal Assessment (Internal Marks – 30). The Internal marks in all the courses/subjects will be awarded based on continuous internal assessment made during the semester concerned. For each Courses/subject 30marks are allotted for internal assessment and 70marks are allotted for the End Semester Examination.

Continuous internal Evaluation(CIE):

It has been decided to introduce Continuous Internal assessment marks for a total of 30 marks, which are to be distributed as follows:

S.No.	Component			Distribution of Marks
1	CIEI(after completion of 50% of syllabus)			50(scaled down to 10)
2	CIEII(after completion of 100% of syllabus)			70(scaled down to 10)
3	ATTENDANCE	Above90%	5	5
		81%to90%	4	
		71%to80%	3	
		61%to70%	2	
		51%to60%	1	
		Below51%	0	
Pedagogical Strategies				
4	Assignment, Participation or Paper Presentation in Student Seminars/Workshops/Group Discussions/Quiz/Student Study Project/Field Visit/Survey			5
TOTAL				30

Component I: CIEI & CIEII(10+10 =20Marks)

Two Internal Examinations for each Course shall be conducted for assessment. These examinations will be conducted during August/September (CIE –I) and January/February (CIE-II). CIE-I carries 50 marks and CIE-II carries 70 marks, each will be scaled to 10 marks. CIE- I will be conducted after completion of 50% of syllabus. The second internal examination, i.e., CIE– II, which will cover the remaining second half of the syllabus. The sum of both the CIEs will be considered for awarding marks for CIA.

Suggestive Question Paper Pattern for CIEI&CIEII(Based on Blooms Taxonomy):

Though the faculty concerned is empowered to adopt their own pattern for question paper, a general and suggestive model for question paper is given below based on Blooms Taxonomy.

QNo	Learning Objective	CIE-I Marks	CIE-II Marks
1	Memory based (Remember)	10	14
2	Understand(Comprehension)	10	14
3	Application	10	14
4	Analysis	07	10
5	Evaluation	07	10
6	Creativity	06	08
	TOTAL	50marks	70 marks

The active verbs used to frame the question based on Blooms Taxonomy is given below for the convenience.

01	02	03	04	05	06
KNOWLEDGE:	UNDERSTAND:	APPLY:	ANALYZE:	EVALUATE:	CREATE:
Define, Identify, Describe, Recognize, Tell, Explain, Recite, Memorize, Illustrate, Quote	Summarize, Interpret, Classify, Compare, Contrast, Infer, Relate, Extract, Paraphrase, Cite	Solve, Change, Relate, Complete, Use, Sketch, Teach, Articulate, Discover, Transfer	Contrast, Connect, Relate, Devise, Correlate, Illustrate, Distill, Conclude, Categorize, Take Apart	Criticize, Reframe, Judge, Defend, Appraise, Value, Prioritize, Plan, Grade, Reframe	Design, Modify, Role-Play, Develop, Rewrite, Pivot, Modify, Collaborate, Invent, Write

Important Note:

Students who absent themselves from any CIE will lose the marks for the respective test. However, if a student is not able to write the CIE/ II because of his/her participation in an important event related to NSS or Games/Sports representing the College/University/health grounds, the student has to get the prior permission of the Principal through the proper channel and submit the same to the Office of the Controller of Examinations. Deadline is 7 days after the CIE. Applications submitted after the deadline will not be considered for the retest.

Component III: Attendance(5Marks)

Attendance mark will be awarded to the students based on their attendance percentage on a particular course. Faculty of each course has to award the attendance mark based on their subject attendance.

The marks split-up is given below

Above90%	5
81%to90%	4
71%to80%	3
61%to70%	2
51%to60%	1
Below50%	0

Component IV: Assignment, Participation or Paper Presentation in Student Seminars/Workshops/Group Discussions/Quiz/Student study Project/Field Visit/Survey (5 Marks)

For this component, the marks will be provided to student, if he/she submitted the assignment or participate/with in the external college technical events. To score marks, the student has to participate/present papers related to subject in the technical events organized in the other colleges/other departments in the college.

Semester End Examinations(SEE)

The question paper is of 3 Hrs duration for 70 marks. The suggestive question paper model is given that may be used for framing the question. This kind of question paper will be helpful in CO-PO Mapping and there by graduate attributes.

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Curriculum 2026-27

Version:1.0

DEPARTMENT OF STATISTICS

SCHEME OF VALUATION FOR PRACTICAL EXAMINATIONS

(As Approved in the BOS meeting held on _____ for 2025-2026)

S.No.	Description	Marks
1	Procedure Explanation with Coding(including Algorithm& Flowchart if any)	15
2	Execution of Program	15
3	VIVAVOCE	10
4	RECORD	10
	Total Internal Marks	50

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Curriculum 2026-27Version: 1.0

B.Sc. Statistics Minor

Program Specific Outcomes

After completion of the program, the student is able to:

1. **PSO1:** Apply statistical concepts, methods and techniques to collect, classify, present and interpret data in real-life situations.
2. **PSO2:** Apply appropriate measures of central tendency, dispersion, probability distributions and statistical methods to solve quantitative problems.
3. **PSO3:**Analyse data using statistical inference, hypothesis testing, correlation, regression and other advanced statistical techniques.
4. **PSO4:** Use statistical software and computational tools to analyse, interpret and visualize data for scientific, social and business applications.
5. **PSO5:** Develop statistical reasoning and problem-solving skills and apply them to research, decision-making and various professional fields.

B.Sc. Statistics Minor

Programme Outcomes

Sl.No.	Program Out comes(POs)-A student will be able to:
PO1:	Demonstrate a strong understanding of fundamental concepts, principles and methods of Statistics and Mathematics.
PO2:	Apply statistical techniques to collect, organize, summarize, analyze and interpret data from real-world situations.
PO3:	Apply probability theory, statistical distributions, estimation, hypothesis testing and other inferential methods to solve statistical problems.
PO4:	Analyze relationships among variables using correlation, regression, analysis of variance and other advanced statistical techniques.
PO5:	Analyze relationships among variables using correlation, regression, analysis of variance and other advanced statistical techniques.
PO6:	Develop logical reasoning, quantitative aptitude, critical thinking and problem-solving skills for academic, research and professional applications.
PO7:	Design and conduct statistical investigations using appropriate sampling, data collection and research methodologies.
PO8:	Interpret statistical results accurately and communicate findings effectively through reports, presentations, tables and graphical representations.
PO9:	Apply statistical knowledge ethically and responsibly in areas such as business, economics, government, social sciences, health and scientific research.
PO10:	Demonstrate the ability to pursue higher education, research, competitive examinations and professional careers requiring statistical and analytical skills.

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R25 COURSE STRUCTURE-B.Sc. (Statistics)

	ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION
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**Model Syllabus for 4- Year UG Honours in B.Sc. (Statistics) as Minor in consonance with
Curriculum framework w.e.f. AY 2026-27**

COURSE STRUCTURE (for Semester I to VI)

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	III	1	Descriptive Statistics	3	3
			Descriptive Statistics Practical Course	2	1
	IV	2	Theory of Probability and Mathematical Expectations	3	3
			Theory of Probability and Mathematical Expectations Practical Course	2	1
III	V	3	Theoretical Distributions	3	3
			Theoretical Distributions Practical Course	2	1
		4	Statistical Methods	3	3
			Statistical Methods Practical Course	2	1
	VI	5	Inferential Statistics	3	3
			Inferential Statistics Practical Course	2	1
		6	Sampling Techniques and Design of Experiments	3	3
			Sampling Techniques and Design of Experiments Practical Course	2	1

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Course Code	Title of the Course	L	S/M	P	C
	Descriptive Statistics	3		2	3
Prerequisites	Basics of Statistics				

COURSEOBJECTIVES
To provide a strong foundation in the basic concepts, scope, functions, and applications of Statistics.
To develop skills in collecting, classifying, presenting, and interpreting statistical data using tables, diagrams, and graphs.
To enable students to understand and apply statistical measures of central tendency and dispersion for data analysis.
To familiarize students with different measurement scales, frequency distributions, and graphical techniques used in descriptive statistics.
To develop the ability to analyze data using moments, Skewness, and kurtosis for understanding the characteristics of statistical distributions.

COURSEOUT COMES		BTL
Upon successful completion of the course, the student will be able to:		
CO1	Explain the basic concepts, scope, importance, functions of statistics, and methods of data collection, classification, and presentation.	Understand
CO2	Apply measurement scales and construct frequency distributions, diagrams, and graphs for effective presentation of data.	Applying, Construct
CO3	Calculate and interpret measures of central tendency (Mean, Median, Mode, Geometric Mean, and Harmonic Mean) for grouped and ungrouped data.	Calculate, Applying
CO4	Analyze data using measures of dispersion, including Range, Quartile Deviation, Mean Deviation, Standard Deviation, Variance, and their coefficients.	Analyzing
CO5	Evaluate the characteristics of a distribution using moments, Sheppard's correction, Skewness, and kurtosis for statistical interpretation.	Evaluate

Syllabus

COURSE CONTENT	
UNIT I	Statistical Description of Data Origin, history and definitions of Statistics. Importance, Scope and limitations Statistics. Function of Statistics – Collection, Presentation, Analysis and Interpretation. Collection of data – primary and secondary data and its methods. Classification of data – Quantitative, Qualitative, Temporal, Spatial. Presentation of data – Textual, Tabular – essential parts.
	Activity: Data collection through surveys/questionnaires and classification of data. Evaluation Method: Class tests and quizzes.
UNIT II	Measurement Scales – Nominal, Ordinal, Ratio and Interval. Frequency distribution and types of frequency distributions, forming a frequency distribution. Diagrammatic representation of data – Histogram, Bar, Multiple bar and Pie with simple problems. Graphical representation of data: Histogram, frequency polygon and Ogive's with simple problems
	Activity: Poster Presentation – students prepare posters with a data set summary (Frequency distribution, Bar, histogram, Ogive curves). Evaluation Method: Assignments and problem-solving exercises.
UNIT III	Arithmetic Mean – properties, methods. Median, Mode, Geometric Mean (GM), Harmonic Mean (HM). Calculation of mean, median, mode, GM and HM for grouped and ungrouped data. Median and Mode through graph. Empirical relation between mean, median and mode. Features of good average.
	Activity: Seminar/Presentation – Computation of measures of central tendency and dispersion using statistical problems. Evaluation Method: Seminar/Presentation on statistical topics (content accuracy, explanation, use of examples, presentation skills).

UNIT IV	Concept and problems – Range, Quartile Deviation, Mean Deviation and Standard Deviation and their coefficients, Variance and its applications viz. Business and Pharmacy etc.
	Activity: Case Study Assignment –Computation of measures of dispersion using statistical problems. Compare the variability of two datasets using measures of dispersion. Evaluation Method: Practical/data analysis using statistical methods. Seminar/Presentation on statistical topics.
UNIT V	Central and Non – Central moments and their interrelationship, Problems. Sheppard's correction for moments and problems. Skewness and its methods, kurtosis and related problems.
	Activity:Analysis of datasets to interpret variability, Skewness, and kurtosis. Group presentations on statistical applications in business, healthcare, and social sciences.Evaluation Method:Submission of case study report + viva (correctness of analysis and interpretation).

TEXTBOOKS
1. Probability and Statistics for Engineers and Scientists, Ronald E. Walpole, Wiley
2. K. Rohatgi & Ehsanes Saleh: An Introduction to Probability and Statistics, John Wiley & Sons
REFERENCEBOOKS
1. O. P. Gupta: Mathematical Statistics, Kedarnath Ramnath & Co.
2. P. N. Arora & S. Arora: Quantitative Aptitude Statistics – Vol. II, S. Chand & Company Ltd.

[Model Blue print for the question paper setter](#)

Sl. No.	UNIT-	Essay10M	Short4M	Weightage
1	I	2	2	20%
2	II	2	2	20%
3	III	2	2	20%
4	IV	2	2	20%
5	V	2	2	20%
		100	40	100%

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II B.Sc.(Hons) STATISTICS

Semester-II

Recommended Format of Question paper for all courses

Time:3Hours

Max.Marks:70

Section-A

Answer any FIVE of the following questions. 5X4=20

1. From Contents of Unit-I
2. From Contents of Unit -II
3. From Contents of Unit -III
4. From Contents of Unit -III
5. From Contents of Unit -IV
6. From Contents of Unit -IV
7. From Contents of Unit -V
8. From Contents of Unit -V

Section-B

B) From Content of Unit –I

9. A) From Contents of Unit-I

B) From Content of Unit –I

OR

10. A) From Contents of Unit-II

B) From Content of Unit –II

OR

11. A) From Contents of Unit-III

B) From Content of Unit –III

OR

12. A) From Contents of Unit-IV

B) From Content of Unit –IV

OR

13. A) From Content of Unit _V

OR

B) From content of Unit-V

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Descriptive Statistics

MODEL QUESTION PAPER(W.E.F2025-2026)

Time:2 ½Hrs.

Max Marks: 70

Q.No	Question	Marks	BL	CO	PO	PI
SECTION-A						
Answer any Five of the Following			5X4=20M			
1	Define Statistics. Explain its scope and importance?	4M				
2	Explain the four levels of measurement scales?	4M				
3	Define Arithmetic Mean and state its properties?	4M				
4	Calculate GM and HM from the data given below: Marks: 45,48,52,55,59,67,74.	4M				
5	Define dispersion and explain its importance?	4M				
6	Compute Coefficient of Quartile Deviation from the following data? X: 24,7,11,9,17,3,20,14,4,22,27.	4M				
7	Explain the effect of change of origin and scale on moments?	4M				
8	Define kurtosis and explain its types?	4M				

SECTION-B						
Answer All Questions			5X10=50M			
9	a). Discuss the methods of collecting primary and secondary data? Compare their merits and demerits? (OR) b). Explain the classification of data with suitable examples.	10M	2	1		
		10M	2	1		
10	a). Explain the construction and uses of histogram, frequency	10M	3	2		

	polygon, and Ogive's with suitable illustrations? (OR) b). Define frequency distribution. Explain its types? Construct a continuous frequency distribution (exclusive type) for the following data. Marks: 20,32,15,26,34,48,64,58,98,74,57,47,43,51,21,85,57,68,75,10,8,5,55,77,49,72,80,54,59,30,18,13,90.								10M	3	2		
11	a).Define Arithmetic Mean and Median? Discuss their properties, andmerits, demerits? (OR)								10M	2	3		
	b). From the following data calculate Mean, Median and Mode								10M	2	3		
	Class intervals	0-5	5-10	10-15	15-20	20-25	25-30	30-35					
	Frequency	8	15	27	30	39	10	18					
12	a).Define dispersion. Explain the various measures of dispersion and their importance?(OR)								10M	3	4		
	b). Calculate Standard deviation and Coefficient of variation from the following data.								10M	2	4		
	Marks	10-19	20-29	30-39	40-49	50-59							
	Number of Student s	8	14	24	16	5							
13	a). Define Central Non Central moments? Obtain the relationship between central moments in terms of raw moments? (OR)								10M	2	5		
	b). Define Skewness. Explain the different methods of measuring Skewness with suitable formulas?								10M	2	5		

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All the Best

Course Code	Title of the Course	L	T	P	C
	Descriptive Statistics			2	1
Prerequisites	Spreadsheets/Excel Lab				

Objectives:

1.To develop practical skills in using **MS Excel** for collecting, organizing, presenting, analyzing, and interpreting statistical data through various statistical techniques and graphical methods.

List of Experiments / Syllabus:

1. Writing a Questionnaire in different situations.
2. Forming a grouped and ungrouped frequency distribution table.
3. Diagrammatic presentation of data – Bar, multiple Bar and Pie.
4. Graphical presentation of data – Histogram, frequency polygon, Ogive's.
5. Computation of measures of central tendency – Mean, Median and Mode.
6. Computation of measures of dispersion – Q.D., M.D and S.D.
7. Computation of non-central, central moments, μ_1 and μ_2 for ungrouped data.
8. Computation of non-central, central moments, μ_1 and μ_2 and Sheppard's corrections for grouped data.
9. Computation of Karl Pearson's and Bowley's Coefficients of Skewness.
10. Computation of Kurtosis.

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Course Code	Title of the Course	L	S/M	P	C
	Theory of Probability and Mathematical Expectations	3		2	3
Prerequisites	Probability Rules				

COURSEOBJECTIVES
Introduce the fundamental concepts of probability, random experiments, events, conditional probability, independence, and probability theorems.
Develop an understanding of discrete and continuous random variables and their probability distributions.
Explain joint, marginal, and conditional distributions of bivariate random variables and their independence.
Develop skills in calculating and interpreting mathematical expectation, moments, variance, covariance, and probability inequalities.
Introduce generating functions and fundamental limit theorems, including the Weak and Strong Laws of Large Numbers and the Central Limit Theorem.

COURSEOUTCOMES		BTL
Upon successful completion of the course, the student will be able to:		
CO1	Apply the basic concepts and theorems of probability, including conditional probability, independence, Bayes' theorem, and Boole's inequality, to solve statistical problems.	Applying
CO2	Analyze univariate random variables and their probability distributions.	Analyzing
CO3	Derive and analyze joint, marginal, and conditional distributions of bivariate random variables and determine their independence.	Derive, Analyzing
CO4	Calculate and interpret mathematical expectation, moments, variance, covariance, and apply Chebyshev and Cauchy–Schwarz inequalities.	Calculate and interpret
CO5	Apply and interpret generating functions, convergence concepts, the Laws of Large Numbers, and the Central Limit Theorem in statistical applications.	Applying, Evaluate

Syllabus

COURSE CONTENT	
UNIT I	Basic Concepts of Probability, random experiments, trial, outcome, sample space, event, mutually exclusive and exhaustive events, equally likely and favourable outcomes. Mathematical, Statistical, axiomatic definitions of probability. Conditional Probability and independence of events, Addition and multiplication theorems of probability for 2 and for n events and simple problems. Boole's inequality, Bayes theorem and its applications in real life problems
	Activity: Classroom discussions, coin/dice experiments, Venn-diagram activities, group problem-solving, numerical exercises, case studies, quizzes, and real-life applications of Bayes' theorem.
	Evaluation Method: MCQs, assignments, worksheets, quizzes, numerical problem-solving, group presentations, internal examinations, viva-voce, and end-semester examination.
UNIT II	Definition of random variable (r.v.), discrete and continuous random variables, functions of random variable. Probability mass function, Probability density function, Distribution function and its properties. Calculation of moments, coefficient of skewness and kurtosis for a given pmf and pdf.
	Activity: Class discussion, numerical exercises and problem-solving. PMF/PDF construction and problem-solving
	Evaluation Method: Quiz, assignment and written test.
UNIT III	Bivariate random variable - meaning, joint, marginal and conditional Distributions, independence of random variables and simple problems.
	Activity: Class discussion, numerical exercises and group problem-solving.
	Evaluation Method: Quiz, assignment and written test.
UNIT IV	Mathematical expectation of function a random variable. Moments and covariance using mathematical expectation with examples. Addition and Multiplication theorems on expectation. Properties of expectations, variance, covariance. Chebyshev and Cauchy-Schwartz inequalities and their applications.
	Activity: Class discussion, numerical exercises, derivations, group problem-solving and applications.

	Evaluation Method: Quizzes, assignments, numerical tests, viva and internal examination.
UNIT V	Definitions of Moment Generating Function, Cumulant Generating Function, Characteristic Function and Probability Generating Function and their properties. Weak Law of Large Numbers (WLLN), Strong Law of Large Numbers (SLLN). Convergence in probability and convergence in distribution, concept of Central limit theorem. Activity: Class discussion, derivations, problem-solving, group activities and practical applications. Evaluation Method: Quizzes, assignments, numerical tests, viva and internal examination.

TEXTBOOKS
1. S. C. Gupta & V. K. Kapoor: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. K. Rohatgi & Ehsanes Saleh: An Introduction to Probability and Statistics, John Wiley & Sons
REFERENCEBOOKS
1. O. P. Gupta: Mathematical Statistics, Kedarnath Ramnath & Co.
2. P. N. Arora & S. Arora: Quantitative Aptitude Statistics – Vol. II, S. Chand & Company Ltd.

[Model Blue print for the question paper setter](#)

Sl. No.	UNIT-	Essay10M	Short4M	Weightage
1	I	2	2	20%
2	II	2	2	20%
3	III	2	2	20%
4	IV	2	2	20%
5	V	2	2	20%
		100	40	100%

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II B.Sc.(Hons) STATISTICS

Semester-II

Recommended Format of Question paper for all courses

Time:3Hours

Max.Marks:70

Section-A

Answer any FIVE of the following questions. 5X4=20

1. From Contents of Unit-I
2. From Contents of Unit -II
3. From Contents of Unit -III
4. From Contents of Unit -III
5. From Contents of Unit -IV
6. From Contents of Unit -IV
7. From Contents of Unit -V
8. From Contents of Unit -V

Section-B

Answer FIVE questions. 5X10=50

9. A) From Contents of Unit-I

OR

B) From Content of Unit -I

10. A) From Contents of Unit-II

OR

B) From Content of Unit -II

11. A) From Contents of Unit-III

OR

B) From Content of Unit -III

12. A) From Contents of Unit-IV

OR

B) From Content of Unit -IV

13. A) From Contents of Unit-V

OR

B) From Content of Unit -V

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Theory of Probability and Mathematical Expectations

MODELQUESTIONPAPER(W.E.F2025-2026)

Time:2 ½Hrs.

Max Marks: 70

Q.No	Question	Marks	BL	CO	PO	PI
SECTION–A						
Answer any Five of the Following			5X4=20M			
1	Define a random experiment, trial, outcome and sample space with examples.	4M				
2	Define distribution function and state its properties.	4M				
3	Explain joint distribution of two random variables.	4M				
4	For the following Density function $f(x)=C x^2(1-x); 0 < x < 1$ Find a). Constant ‘C’ b). Mean?	4M				
5	Define mathematical expectation of a random variable.	4M				
6	State Cauchy–Schwarz inequality.	4M				
7	Define Probability Generating Function (PGF).	4M				
8	Explain the Weak Law of Large Numbers.	4M				

SECTION–B						
Answer All Questions			5X10=50M			
9	a).Explain various definitions probability and State and prove	10M	2	1		

	Multiplication theorem for n events? (OR) b). The contents of urns I, II and III are as follows Urn I: 1white, 2 black and 3 red balls Urn II: 2 white, 1 black, and 1 red balls Urn III: 4 white, 5 black and 3 red balls One urn is chosen at random and two balls are drawn, they happen to be white and red. Find the Probability that they come from urns I, II and III.	10M	2	1		
10	a). Explain discrete and continuous random variables and explain probability mass function and probability density function? (OR) b)). continuous random variable X has the following density function $f(x)=Ax^2$; $0 \leq x \leq 1$ i). Determine A, ii). Find the probabilities a). X lies between 0.2 and 0.5 b). X is less than 0.3 c). $\frac{1}{4} \leq x < \frac{1}{2}$ d). $X > \frac{3}{4}$ $\frac{1}{4} \leq x < \frac{1}{2}$ $X > \frac{3}{4}$	10M 10M	3 3	2 2		
11	a). Define Bivariate random variables and explain the concepts of joint, marginal and conditional? (OR) b). The Joint P.D.F of X and Y is given by $f(x, y) = Axy$; $0 \leq x \leq 1$; $0 \leq y \leq \infty$ Find a). Determine A b). Find conditional p.d.f of Y given X= 2. c). Check the independence of random variables?	10M 10M	2 2	3 3		
12	a).State and prove the addition theorem of mathematical Expectation? (OR) b). State and prove Chebyshev's inequality?	10M 10M	3 2	4 4		
13	a). Define Moment Generating function and discuss its importance properties? (OR) b). Define Characteristic Generating function and discuss its importance properties?	10M 10M	2 2	5 5		

****All the Best****

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Course Code	Title of the Course	L	T	P	C
	Theory of Probability and Mathematical Expectations			2	1
Prerequisites	Spreadsheets/Excel Lab				

Objectives:

1.To develop practical skills in using **MS Excel** for collecting, organizing, presenting, analyzing, and interpreting statistical data through various statistical techniques and graphical methods.

List of Experiments:

1. Calculation of moments of univariate random variable to the given p.m.f.
2. Calculation of coefficient of skewness and kurtosis of univariate random variable to the given probability mass function (p.m.f).
3. Calculation of moments of univariate random variable to the given pdf.
4. Calculation of coefficient of skewness and kurtosis of univariate random variable to the given probability density function (p.d.f).
5. Problem related to joint p.m.f, marginal p.m.f and conditional p.m.f and its independence.
6. Problem related to joint p.d.f, marginal p.d.f and conditional p.d.f and its independence.
7. Chebyshev's inequality application oriented problems.

MULTIDISCIPLINARY COURSES

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Course Code	Title of the Course	L	S/M	P	C
	Basic Statistics	3		2	3
Prerequisites	Basic Data Handling				

COURSEOBJECTIVES
To develop fundamental knowledge of statistical concepts, data collection, classification, tabulation, frequency distributions, and graphical representation.
To develop skills in computing and interpreting measures of central tendency and dispersion for summarizing and analyzing data.
To introduce the basic concepts of skewness, correlation, and linear regression and their applications in statistical data analysis.

COURSEOUTCOMES		BTL
Upon successful completion of the course, the student will be able to:		
CO1	Explain and apply basic statistical methods for collecting, classifying, tabulating, and presenting data using appropriate graphical techniques.	Understand &Applying
CO2	Calculate and interpret measures of central tendency and dispersion and analyze the characteristics and variability of statistical data.	Applying &Analyzing
CO3	Apply and interpret basic concepts of skewness, correlation, and linear regression to understand relationships and patterns in data.	Applying & Understanding

Syllabus

COURSECONTENT	
UNIT I	Meaning, scope and limitations of Statistics Collection of data: Primary and Secondary, Classification and Tabulation, Construction of frequency distribution. Graphical Representation: Histogram, Bar, Pie and Frequency polygon.
	Activity: Collect, classify, tabulate, and graphically represent a small dataset.. EvaluationMethod:Assignment and practical assessment.
UNIT II	Measures of Central Tendency: Features of good average, Arithmetic Mean, Median, Mode. Empirical relationship between Mean Median and Mode and skewness based on central values.
	Activity:Calculate and interpret Mean, Median, Mode, and skewness for a given dataset. Class discussion, numerical exercises and problem-solving. EvaluationMethod:Quiz, assignment and written test.
UNIT III	Measures of Dispersion: Range, Quartile Deviation(QD), Mean Deviation(MD), Variance, Standard Deviation (SD), relationship between QD, MD and SD. Familiarizationof the concepts relating to Correlation and Linear Regression line.
	Activity:Class discussion, numerical exercises and group problem-solving. Evaluation Method: Problem-solving assignment and practical assessment..

TEXTBOOKS
1. Statistics (Theory, Methods, Application) D C Sancheti, V K Kapoor, Sultan Chand and Sons, New Delhi
2. Statistical Methods, S.P. Gupta, Sultan Chand and Sons, New Delhi
3. Statistics (Theory and Practice) B.N Gupta, Sahitya Bhavan, Agra

Web sites for free download books for Statistics

<https://www.pdfdrive.com/introduction-to-statistics-books.html>

[http://www.freebookcentre.net/SpecialCat/Free-Statistics-](http://www.freebookcentre.net/SpecialCat/Free-Statistics-BooksDownload.html)

[BooksDownload.htmlhttps://bookboon.com/en/statistics-](https://bookboon.com/en/statistics-ebooks)

[ebookshttp://onlinestatbook.com/Online_Statistics_Education.pdf](http://onlinestatbook.com/Online_Statistics_Education.pdf)

Co-curricular activities:

Objective is to apply the theoretical concept to real life data which enhances the learning and interpretation ability to the current environment.

Co-CA I: (i) Collect primary or secondary data and establish frequency distribution.

(ii) Suitable pictorial/ Graphical representation to the established frequency distribution

Co-CA II: (i) Select the data and then calculate AM, Median and Mode and interpret the result.

(ii) Calculate the skewness based on central values and interpret the degree of departure of a distribution from symmetry and the direction of scatterness of the items.

Co-CA III: (i) Calculate the dispersion values of a data for a single or double data sets and to draw conclusions from the comparison of averages.

(ii) Select the bivariate data (for example, select marks of any two subjects of your course) and calculate the degree of association and establish the linear relationship and find the forecasting value.

Co-CA IV: If there is an internet facility at your college/home, go through the Ministry of Statistics and Program Implementationsite www.mospi.gov.in to know about the Indian Statistical System and <https://desap.cgg.gov.in> or www.apdes.in to

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know about the Andhra Pradesh Directorate of
and Statistics(APDES) and its activities.

II B.Sc. STATISTICS Minor

Semester-IV

Recommended Format of Question paper for all courses

Time:2 Hours Max. Marks:50

Section-A

Answer any FIVE of the following questions. 5X10=50

1. From Contents of Unit-I
2. From Contents of Unit -II
3. From Contents of Unit -III
4. From Contents of Unit -III
5. From Contents of Unit -IV
6. From Contents of Unit -IV
7. From Contents of Unit -V
8. From Contents of Unit -V

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BASIC STATISTICS

MODEL QUESTION PAPER (W.E.F2026-2027)

Time:2 Hrs.

Max Marks: 50

Q.No	Question						Marks	BL	CO	PO	PI		
SECTION–A													
Answer any Five of the Following						5X10=50M							
1	Discuss the methods of collecting primary and secondary data? Compare their merits and demerits?						10M						
2	Define classification and different types of classification?						10M						
3	Compute Arithmetic Mean, Median & Mode of the following data?						10M						
	Class Intervals	10-20	20-30	30-40	40-50	50-60						60-70	
	Frequen cy	3	5	20	10	7						4	
4	Find coefficient of quartile deviation for the following data						10M						
	Marks	10-19	20-29	30-39	40-49	50-59							
	No. of Students	14	20	32	26	18							
5	Find mean deviation from mean, median and mode for the following data						10M						
	Class Intervals	10-20	20-30	30-40	40-50	50-60						60-70	
	Frequency	12	15	20	25	16						14	
6	Calculate coefficient of standard deviation to the following data.						10M						
	Class intervals	20-30	30-40	40-50	50-60	60-70						70-80	80-90
	Frequency	3	61	132	153	140						51	2
7	Define Symmetric distribution& explain various methods of skewness?						10M						
8	Calculate P_k and B_k for the following data.						10M						
	Class intervals	5-10	10-15	15-20	20-25	25-30							
	Frequency	8	20	42	54	36							