

M. G. Science Institute, Ahmedabad

Autonomous | Affiliated to Gujarat University, Ahmedabad

(Managed by The Ahmedabad Education Society)

Department of Statistics

Bachelor of Science (Hons.) in Statistics

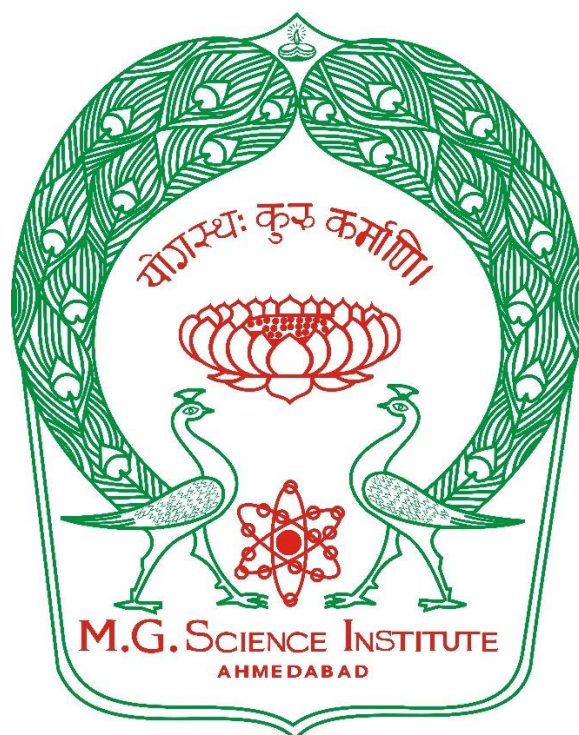
B.Sc. (Hons.) Statistics

4 Year, 8 Semester Full-Time Programme

Choice Based Credit System (CBCS) & Grading System

Outcome-Based Education Pattern

(Effective from Academic Year 2024-25)



Detailed Syllabus for Each Course B.Sc. (Hons.) Statistics

STE364T Statistics for Mathematics III

Semester: IV	Course Title: Statistics for Mathematics (T)	Credit: 2
Course No.: STE364		Hours: 2/week

Course Outcomes: On successful completion of the course the learner will be able to

CO	COGNITIVE ABILITIES	COURSE OUTCOMES
CO 1	REMEMBERING	Recall fundamental concepts of quality control, control charts, and variation in industrial processes.
CO 2	UNDERSTANDING	Explain the principles of Statistical Quality Control (SQC) and the theory behind control charts for variables and attributes.
CO 3	APPLYING	Apply methods for constructing \bar{x} , R, S, p, np, c, and u charts to monitor process quality.
CO 4	ANALYSING	Analyse control charts to detect assignable causes of variation and interpret process behavior.
CO 5	EVALUATING	Evaluate process control performance using tolerance limits, specification limits, and operating characteristic (OC) function.
CO 6	CREATING	Design quality control procedures and select appropriate control charts for real-world industrial applications.

CO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	0	0
CO2	2	3	2	1	0
CO3	1	2	3	2	1
CO4	0	1	2	3	2
CO5	0	1	2	3	3
CO6	0	0	1	2	3

Unit	Detailed Syllabus	No. of Hours of Teaching
I	Introduction to Statistical Hypothesis <ul style="list-style-type: none"> Introduction: Concept of hypothesis in statistics, importance in research. Statistical Hypothesis & Testing: Null hypothesis (H_0), Alternative hypothesis (H_1). Errors in Testing: Type I and Type II errors with simple examples. P-value: Concept, interpretation, and decision-making. Large Sample Tests: Test for mean and proportion. Small Sample Tests: Idea of t-distribution, examples for small samples 	15
II	Parametric Tests: <ul style="list-style-type: none"> One-sample t-test (mean testing). Independent two-sample t-test (comparing two groups). 	15

	<ul style="list-style-type: none"> • Paired t-test (before-after type problems). <p>Non-Parametric Tests:</p> <ul style="list-style-type: none"> • One-sample Kolmogorov–Smirnov test (goodness of fit). • Mann–Whitney U test (alternative to independent t-test). • Wilcoxon Signed Rank test (alternative to paired t-test). <p>Chi-square test (goodness of fit, independence).</p>	
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Suggested Reference Books:

1. Applied Statistics, Publisher: Books & Allied (P) Ltd. Mukhopadhyay P. (2015).
2. Basic Statistics, Agarwal, B. L., New Age International (P) Ltd.
3. Introduction to the theory of Statistics, Mood, A. M., Greybill, F.A., Boes, D.C., McGraw Hill.
4. Fundamentals of Mathematical Statistics, S. C. Gupta and V. K. Kapoor, Sultan Chand and Sons, New Delhi.
5. Statistical Methods, Tata Mcgraw Hill Publishing. Das (2009).
6. Statistical analysis: Graphs and diagrams, S. M. Nair and M. Garg, Spectrum Books (P) Ltd, New Delhi.

STE364 P Statistics for Mathematics-III

Semester: IV	Course Title: Statistics for Mathematics-III (P)	Credit: 2
Course No.: STE364 (P)		Hours: 4/week

Part A: Manual

Sr. No.	Title of the Practical	No. of Hours of Teaching
1	Large Sample Tests – Test for population mean and proportion. One Sample and Two samples.	30
2	Small Sample Tests – One-sample and two-sample t-tests.	
3	Paired t-test – Before–after type problems.	
4	Chi-square Test – Goodness of fit and test of independence.	
5	Sign Test / Median Test – Non-parametric test for small samples.	

Part B: Computer

Sr. No.	Title of the Practical	No. of Hours of Teaching
1	Large Sample Tests – Test for population mean and proportion. One Sample and Two samples.	30
2	Small Sample Tests – One-sample and two-sample t-tests.	
3	Paired t-test – Before–after type problems.	
4	Chi-square Test – Goodness of fit and test of independence.	
5	Sign Test / Median Test – Non-parametric test for small samples.	