COURSE CODE	COURSE NAME	L	T	P	CREDIT	YEAR OF INTRODUCTION
101009/ MA100B	INTRODUCTORY TOPICS IN STATISTICS, PROBABILITY AND CALCULUS	3	0	0	3	2021

1. **Preamble:** This course introduces to some basic mathematical ideas and tools about probability distributions and statistical methods of analyzing data. A brief course in statistics familiarizes students about the various applications.

2. **Prerequisite:** Basic study of probability and Statistics in school class. Basic calculus.

3. **Syllabus:**

Module 1:

Introduction to Statistics: Definition of Statistics. Basic objectives. Applications in various branches of science with examples. Collection of Data: Internal and external data, Primary and secondary Data. Population and sample, Representative sample.

Module 2:

Descriptive Statistics: Classification and tabulation of univariate data, graphical representation, Frequency curves. Descriptive measures - central tendency and dispersion. Bivariate data. Summarization, marginal and conditional frequency distribution.

Module 3:

Probability: Concept of experiments, sample space, event. Definition of Combinatorial Probability. Conditional Probability, Bayes Theorem.

Module 4:

Probability distributions: discrete& continuous distributions, Binomial, Poisson and Geometric distributions, Uniform, Exponential, Normal, Chi-square, t, F distributions. Expected values and moments: mathematical expectation and its properties, Moments (including variance) and their properties, interpretation, Moment generating function.

Module 5:

Calculus: Basic concepts of Differential and integral calculus, application of double and triple integral.

4. Text Books:

1. S.M. Ross, *Introduction of Probability Models*, Academic Press, N.Y.
2. A. Goon, M. Gupta and B. Dasgupta, *Fundamentals of Statistics*, *vol. I & II*, , World Press.
3. B. S. Grewal, *Higher Engineering Mathematics*, Khanna Publication, Delhi.

5. Reference Books

1. S.M. Ross, *A first course in Probability*,Prentice Hall.
2. I.R. Miller, J.E. Freund and R. Johnson, *Probability and Statistics for Engineers*, (Fourth Edition), PHI.
3. A.M. Mood, F.A. Graybill and D.C. Boes, *Introduction to the Theory of Statistics*, McGraw Hill Education.
4. Peter V. O'Neil, *Advanced Engineering Mathematics*, (Seventh Edition), Thomson Learning.
5. M. D. Greenberg, *Advanced Engineering Mathematics*, (Second Edition), Pearson Education.
6. P. N. Wartikar andJ. N. Wartikar, *Applied Mathematics, Vol. I & II*,Vidyarthi Prakashan.

6. Course Outcomes:

After the completion of the course the student will be able to

CO 1: Know the methods of collecting data and samples
CO 2: Understand about central tendency and dispersion
CO 3: Understand probability and Baye's theorem
CO 4: Know the probability distributions
CO 5: understand the basics of differentiation and integration

7. Mapping of Course Outcomes with Program Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	3	3	3	3	2	1				2		2
CO 2	3	3	3	3	2	1				2		2

CO 3	3	3	3	3	2	1				2		2
CO 4	3	3	3	3	2	1				2		2
CO 5	3	3	3	3	2	1				2		2

8. Assessment Pattern:

Bloom's Category	**Continuous Assessment Tests**		**End Semester Examination Marks**
	Test 1 (25 Marks)	**Test 2 (25 Marks)**	
Remember	10	10	10
Understand	30	30	30
Apply	30	30	30
Analyse	20	20	20
Evaluate	10	10	10
Create			

9. Mark Distribution:

Total	CIE				ESE
	Attendance	Internal Examination	Assignment / Quiz / Course Project	Total	
150	10	25 (Average of 2 scores)	15	50	100

10. End Semester Examination Pattern:

There will be 2 parts – Part A and Part B.

Part A contains 10 questions with 2 questions from each module, having 3 marks for each question. Students should answer all questions. Part B contains 2 questions from each module of which students should answer any one. Each question can have maximum 2 sub divisions and carry 14 marks.

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