

**UNIVERSITY OF MADRAS**  
**BACHELOR OF COMPUTER APPLICATIONS (BCA)**  
**DEGREE PROGRAMME**  
 SYLLABUS WITH EFFECT FROM 2023-2024

**Year: II**

**Semester: IV**

<b>Elective: Statistics-II</b> (Common to B.Sc.-CS, CS with AI, CS with DS & Software Appl.)		<b>220E4B</b>
<b>Lecture Hours: 5 per week</b>		<b>Credits:3</b>
<b>Learning Objectives:</b> (for teachers: what they have to do in the class/lab/field)		
<b>Course Objectives:</b>		
<ol style="list-style-type: none"> <li>1. Understand Probability and its properties</li> <li>2. Learn characteristics of different discrete and continuous distributions.</li> <li>3. Know situation to which different distributions can be applied.</li> <li>4. Comprehend the Sampling distributions.</li> <li>5. Learn how to apply statistical tests to get information from data</li> </ol>		
<b>Units</b>	<b>Contents</b>	
<b>I</b>	Basic concepts of Probability: Random Experiments, Sample space, Trial, Events, - Classical and empirical approach to probability and their limitations –Types of events: Exhaustive, mutually exclusive, equally likely and Independent events - Axiomatic approach to probability - Basic theorems on probability using axiomatic approach. Bayes Theorem (statement only)	
<b>II</b>	Discrete probability mass function, cumulative distribution function- Theory and problems based on it. Bernoulli distribution, Binomial Distribution and Poisson Distribution	
<b>III</b>	Continuous probability density function, cumulative distribution function - Theory and problems based on it. Normal Distribution and its properties, Standard Normal distribution, Problems based on it. Exponential Distribution	
<b>IV</b>	Introduction of Sampling distributions- student's t and chi-square distributions, distribution of sample mean from normal distribution. Density function and Properties only.	
<b>V</b>	Testing of Hypothesis, Single mean test and double means test based on normal distribution and students t-distribution. Proportion test, Chi-square test, ANOVA test.	

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**Course Outcomes:** Upon finishing point of this course, students will be able to

1. understand the basic concept of Probability
2. identify the characteristics of different discrete and continuous distributions.
3. identify the type of statistical situation to which different distributions can be applied comprehend the Sampling distributions.
4. understand how to apply statistical tests to get information from data.

**Suggested Readings:**

**Books for study:**

1. Gupta, S.C and Kapoor, V.K.(2002), *Fundamentals of Mathematical Statistics*, Sultan Chand and 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. Irwin Miller, Marylees Miller(2006): *John E. Freund's Mathematical Statistics with Applications*, (7th Edn.), Prentice Hall International INC.
4. 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

**Books for reference:**

1. Saxena H.C.: *Elementary Statistics*. S.Chand & Co., 2009.