COURSE MODULES OF THE SUBJECT TAUGHT FOR THE ODD SESSION 2023

Course Syllabi with CO's

Faculty Name :			**Academic Year**: 2023-24 (ODD SEMESTER)				
Department: Mathematics FOR Computer Science (BCS301)							
Course Code	**Course Title**	**Core/Elective**	**Pre-requisite**	**Contact Hours**			**Total Hrs/ Sessions**
				L	T	P	
BCS301	Mathematics for Computer Science	**Core**		**3**	**2**	**-**	**40**
Objectives	This course will enable the students to: 1. To introduce the concept of random variables, probability distributions, specific discrete and continuous distributions with practical application in Computer Science Engineering and social life situations. 2. To Provide the principles of statistical inferences and the basics of hypothesis testing with emphasis on some commonly encountered hypotheses. 3. To Determine whether an input has a statistically significant effect on the system's response through ANOVA testing.						

Topics Covered as per Syllabus

Module-1: Probability Distributions

Probability Distributions: Review of basic probability theory. Random variables (discrete and continuous), probability mass and density functions. Mathematical expectation, mean and variance. Binomial, Poisson and normal distributions- problems (derivations for mean and standard deviation for Binomial and Poisson distributions only)-Illustrative examples. Exponential distribution.

Module-2: Joint probability distribution & Markov Chain

joint probability distribution: Joint Probability distribution for two discrete random variables, expectation, covariance and correlation.

Markov Chain: Introduction to Stochastic Process, Probability Vectors, Stochastic matrices, Regular stochastic matrices, Markov chains, Higher transition probabilities, Stationary distribution of Regular Markov chains and absorbing states.

Module-3: Statistical Inference 1

Introduction, sampling distribution, standard error, testing of hypothesis, levels of significance, test of significances, confidence limits, simple sampling of attributes, test of significance for large samples, comparison of large samples.

Module-4: Statistical Inference 2

Sampling variables, central limit theorem and confidences limit for unknown mean. Test of Significance for means of two small samples, students 't' distribution, Chi-square distribution as a test of goodness of fit. F-Distribution.

Module-5: Design of Experiments & ANOVA

Principles of experimentation in design, Analysis of completely randomized design, randomized block design. The ANOVA Technique, Basic Principle of ANOVA, One-way ANOVA, Two-way ANOVA, Latin-square Design, and Analysis of Co-Variance.

List of Text Books

1. Ralph P. Grimaldi and B V Ramana, Discrete and Combinatorial Mathematics- An Applied Introduction, Pearson Education, Asia, Fifth edition – 2007. ISBN 978-81-7758-424-0.
2. Higher Engineering Mathematics B. S. Grewal Khanna Publishers 44th Edition, 2017

List of Reference Books

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata – McGraw Hill, Sixth Edition, Sixth reprint 2008. ISBN-(13):978-0-07-064824-1.
2. C. L. Liu and D P Mohapatra, Elementary Discrete Mathematics, Tata- McGraw Hill, Sixth Edition,

ISBN:10:0-07-066913-9.
3. J.P. Tremblay and R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata – McGraw Hill, 35TH reprint 2008. ISBN 13:978-0-07-463113-3.
4. Advanced Engineering Mathematics C. Ray Wylie, Louis C.Barrett McGraw-Hill 6th Edition 1995
5. Higher Engineering Mathematics B. V. Ramana McGraw-Hill 11th Edition,2010
6. A Text-Book of Engineering Mathematics N. P. Bali and Manish Goyal Laxmi Publications 2014
7. Advanced Engineering Mathematics Chandrika Prasad and Reena Garg Khanna Publishing, 2018

List of URLs, Text Books, Notes, Multimedia Content, etc

http://nptel.ac.in/courses.php?disciplineID=111
http://www.class-central.com/subject/math(MOOCs)
http://academicearth.org/
http://www.bookstreet.in.
VTU EDUSAT PROGRAMME – 20
VTU e-Shikshana Program

Course Outcomes	**Course Outcomes:** At the end of the course, the student will be able to: 1. Explain the basic concepts of probability, random variables, probability distribution models for the given scenario 2. Apply the notion of a discrete-time Markov chain and n-step transition probabilities to solve the given problem 3. Use statistical methodology and tools in the engineering problem-solving process. 4. Compute the confidence intervals for the mean of the population. 5. Apply the ANOVA test related to engineering problems

Internal Assessment Marks: For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code:	BCS301	**TITLE Mathematics for Computer Science**						**Faculty Name:**					
List of Course Outcomes	**Program Outcomes**												**Total**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	
CO-1	2	3	-	-	-	-	-	-	-	-	-	2	**7**
CO-2	2	2	-	-	-	-	-	-	-	-	-	1	**5**
CO-3	2	3	-	-	-	-	-	-	-	-	-	1	**6**
CO-4	2	3	-	-	-	-	-	-	-	-	-	1	**6**
CO-5	2	3	-	-	-	-	-	-	-	-	-	1	**6**
Total	**10**	**14**	-	-	-	-	-	-	-	-	-	**6**	**30**

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution