

DEPARTMENT OF COMPUTER APPLICATIONS
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Course Title	Probability and Statistical methods		
Course Code	CA719	No. of Credits	3
Department	Computer Applications	Faculty	Dr. S.Domnic
Course Teacher(s)/Tutor(s) E-mail	domnic@nitt.edu	Telephone No.	0431-2503745
Class committee Chairperson	Dr. R.Gangadaran	Sec	A
Course Type	Core course		

SYLLABUS

Probability Spaces- Combinatorial methods (or) Counting techniques- Elementary Theorem – Conditional Probability – Bayes’ theorem- Probability Distributions and Probability Densities.

Mathematical Expectation: Expected value- Moments- Chebyshev’s theorem- Moment Generating functions-Product Moment-Conditional Expectation- Special Probability Distributions and Probability Densities- Functions of Random Variable. Multiple regression- Linear models- Logistic regression- Rates and Poisson regression- Nonlinear curve fitting – correlation.

Descriptive Statistics & Sampling Distributions: Population-Sampling- Measures of Central tendency, variations and position – Sampling distributions: Standard Normal Distribution- Chi-Square Distribution- t-Distribution –F-Distribution -The Central Limit Theorem.

Estimation: Point Estimation: the method of moments and the method of maximum likelihood estimation- Interval estimation: estimation of mean, estimation of difference of means, estimation of variance and estimation of ratio of variances.

Test of Hypothesis- Testing for Attributes – Mean of Normal Population – One-tailed and two-tailed tests, F-test and Chi-Square test – Analysis of Variance- Nonparametric test.

COURSE OVERVIEW

Probability theory is the branch of mathematics that deals with modelling uncertainty and it finds direct application in areas such as finance, Insurance, Text mining etc. It also forms the basis for many other areas in the mathematical sciences including statistics as well as modern optimization methods. This course provides a foundation in both probability theory and mathematical statistics with an indication of the relevance and importance of the theory in solving problems in the real world.

COURSE OBJECTIVES			
<ul style="list-style-type: none"> To learn the fundamentals of probability and statistics 			
COURSE OUTCOMES			Aligned Programme Outcomes (PO)
1. Explain basic probabilistic and statistical models and illustrate their applications			1,2
2. Estimate the likelihood of events from population			1,2,4
3. Propose, test and evaluate hypothesis			1,2,4
COURSE TEACHING AND LEARNING ACTIVITIES			
Week	Class	Topic	Mode of Delivery
1	1	Introduction to Probability, Application areas.	chalk and Talk Presentation Problem solving
	2	Elementary Probability Theory	
	3	Combinatorial methods (or) Counting techniques	
2	1	Conditional Probability – Bayes’ theorem	-do-
	2	Discrete Probability Distributions	
	3	Probability Densities	
3	1	Mathematical Expectation: Expected value	-do-
	2	Moments	
	3	Moment Generating functions, Product Moment	
4	1	Conditional Expectation	-do-
	2	Special Probability Distributions Binomial, Uniform, Normal	
	3	Functions of Random Variable	
5	1	Multiple Regression- Linear models	-do-
	2	Logistic regression, Rates and Poisson regression	
	3	Nonlinear curve fitting – correlation.	
6	1	Descriptive Statistics	-do-
	2	Sampling Distributions: Population-Sampling	
	3	Measures of Central tendency, variations and position	
7	1	Sampling distributions: Standard Normal Distribution	-do-
	2	Chi-Square Distribution- t-Distribution	
	3	F-Distribution -The Central Limit Theorem.	
8	1	Estimation: Point Estimation: the method of moments	

	2	Method of maximum likelihood estimation	-do-
	3	Interval estimation	
9	1	Estimation of mean, estimation of difference of means	-do-
	2	Estimation of variance	
	3	Estimation of ratio of variances.	
10	1	Test of Hypothesis- Testing for Attributes	-do-
	2	Mean of Normal Population	
	3	One-tailed and two-tailed tests, F-test	
11	1	Chi-Square test	-do-
	2	Analysis of Variance	
	3	Nonparametric test.	

COURSE ASSESSMENT METHODS

Sl.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Test 1	After completion of 2 units	1 Hr	20
2	Test 2	After completion of 4 units	1 Hr	20
3	Assignment	6 th week	1 week	10
4	Semester	At the end of course	3 hrs	50

ESSENTIAL READINGS :

1. John.E.Freund, Irwin Miller, Marylees Miller “Mathematical Statistics with Applications“, 8th, Prentice Hall of India, 2014
2. Yannis viniotis, “Probability and Random Processes for electrical engineers”, McGraw-Hill International Edition, 1997.
3. Ross, Sheldon. M, “Introduction to Probability and Statistics for Engineers and Scientists”, Academic Press, 2009.

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

- The students through the class representative may give their feedback at any time to the course faculty which will be duly addressed.
- The students may also give their feedback during Class Committee meeting.
- The COs will be computed after arriving at the final marks.

COURSE POLICY

MODE OF CORRESPONDENCE

Through email: domnic@nitt.edu

PLAGIARISM

The students are expected to come out with their original solution for problems given as assignment, and tests/examinations.

COMPENSATION ASSESSMENT POLICY

One compensation assessment will be given after completion of Cycle Test 1 and 2 for the students those who are absent for any assessment due to genuine reason. The prior permission and required document must be submitted for absence

Attendance

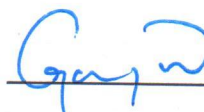
100% is a must. However, relaxation upto 25% will be given for leave on emergency requirements (medical, death, etc.) and representing institute events.

For Approval

Course Faculty



CC-Chairperson



HOD

