



National Institute of Technology Meghalaya
An Institute of National Importance

CURRICULUM

Programme	Bachelor of Technology	Year of Regulation	2019-20
Department	Mathematics	Semester	VI

Course Code	Course Name	Pre-Requisite	Credit Structure				Marks Distribution			
			L	T	P	C	INT	MID	END	Total
MA 374	Statistical Methods	NIL	2	0	0	2	50	50	100	200

Course Objectives	To provide an understanding of statistical concepts to sampling, estimation, hypothesis testing, regression, and correlation analysis.	Course Outcomes	CO1	Able to distinguish between a population and a sample, and between parameters and statistics.
			CO2	Able to recognize the importance of statistical modeling and computing, and the role of approximation and mathematical approaches to analyze the real problems using various statistical tools.
			CO3	Able to understand problem of point and interval estimation, and obtain estimators using estimation methods such as Maximum likelihood, method of moments.
			CO4	Able to perform test of hypothesis as well as calculate confidence interval for a population parameter
			CO5	Able to gain knowledge of correlation, regression analysis.
			CO6	

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	2			2											
2	CO2	2			2											
3	CO3	2			2											
4	CO4	2			2											
5	CO5															
6	CO6															

SYLLABUS

No.	Content	Hours	COs
I	Sampling Distributions: Purpose and the nature of sampling, its uses and applications; Data analysis, graphical and numerical summaries; Distributions of the sample mean and the sample variance for a normal population, Chi-squared, t and F-distributions.	05	CO1 CO2
II	Estimation: Nature of estimates, point estimates, interval estimates; Criteria to be applied to single point estimators, unbiased estimators, consistent estimators, efficiency of estimators; Method of moments and maximum likelihood principle approach, least squares approach; applicability conditions; Confidence intervals for parameters in one sample and two sample problems of normal populations.	07	CO2 CO3

III	Hypothesis Tests: Development of models and associated hypotheses, the nature of these; Hypothesis formulation, null and alternate hypotheses; Testing hypothesis based on a single parameter, choice of test statistic; choice of samples and distributions; Criteria for acceptance of hypothesis; t-test, Chi-squared test; applicability criteria for these.	08	CO2 CO4
IV	Correlation and Regression: Definition and calculation of correlation coefficients; Approaches to regression, the linear model approach, the least squares fitting approach, strengths and weaknesses of these and conditions for applicability.	04	CO2 CO5
Total Hours		24	
Essential Readings			
1. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists", Academic Press, 3 rd edition, 2004.			
2. W. W. Hines, D.C. Montgomery, D.M. Goldsman and C.M. Borror, "Probability and Statistics in Engineering", Wiley India Pvt. Ltd., 4 th edition, 2003.			
Supplementary Readings			
1. V. K. Rohatgi and A. K. Saleh, "An Introduction to Probability and Statistics", Wiley India Pvt. Ltd, 2nd Edition, 2014.			
2. S. C. Gupta and V. K. Kapoor, "Fundamentals of Mathematical Statistics" , Sultan Chand and Sons, New Delhi, 11th edition, 2002.			