	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM

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

Course Code	Course Name	Pre-Requisite	Credit Structure				Marks Distribution			
			L	T	P	C	INT	MID	END	Total
MA 371	**Probability Theory & Distributions**	**NIL**	**2**	**0**	**0**	**2**	**50**	**50**	**100**	**200**

Course Objectives	To provide students with a formal mathematical treatment of probability theory, probability distributions and densities with practical applications	Course Outcomes	**CO1**	Able to gain ability to distinguish between random and non-random experiments
			CO2	Able to calculate probabilities of events and learn the notion of conditional probability including the concept of Bayes' Theorem
			CO3	Able to understand the concepts of discrete and continuous random variables and their probability distributions including expectation and moments
			CO4	Able to apply standard discrete and continuous probability distributions to practical problems
			CO5	
			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	**Discrete Probability:** Randomness, finite probability space, probability measure, events, Conditional probability, independence, Bayes' theorem.	**04**	**CO1** **CO2**
II	**Discrete Random Variables:** Binomial, Poisson, geometric distributions, mean and variance: concepts, significance, computations, applications.	**06**	**CO1** **CO2** **CO3** **CO4**
III	**Continuous Random Variables:** Exponential, Gamma and normal distribution: probability density functions, calculation of mean and variance; The central limit theorem and the implications for the normal distribution; Joint distribution, Distributions of sums of random variables.	**10**	**CO3** **CO4**

IV	**Expectation:** Moments, transform methods, conditional expectation, examples.	**4**	**CO3** **CO4**
Total Hours		**24**	

Essential Readings

1. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists'', Academic Press, 3rd 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., 4th 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.