

# Mizoram University

## UG/Bachelor's Degree Programme with Multiple Entry and Exit Options

### Under the New Education Policy 2020

in

### Statistics

### First Semester

Semester	Course Code	Course Name	Components with Credits		Total credits
			Theory	Practical	
I	STA/MJ/100	Descriptive Statistics	3	1	4
	STA/MJ/101	Probability Theory	4	-	4
	STA/MN/102	[To be chosen from an MJ course offered by other disciplines]	4	-	4
		Introductory Course (Interdisciplinary)	3	-	3
	AEC/103	MIL/English I	3	-	3
	VAC/104	Understanding India	2	-	2
					<b>20</b>

# Descriptive Statistics

STA/MJ/100

Credits: 3 (Theory) + 1 (Practical)

## Theory

- Unit 1 Concept of central tendency, measures of central tendency: mathematical and positional, partition values, measures of dispersion: range, quartile deviation, mean deviation, standard deviation, relative dispersion, coefficient of variation. Their related properties uses and limitations.
- Unit 2 Moments, absolute moments, factorial moments, kurtosis, skewness and their different measures, Sheppard's corrections (without proof), Bivariate data: Scatter diagram, product moment correlation coefficient and its properties, coefficient of determination, rank correlation.
- Unit 3 Partial and multiple correlation in three variables, their measures and related results, Correlation ratio, Intraclass correlation, Regression, principle of least square, fitting of regression line and related results.
- Unit 4 Theory of attributes: Independence and Association of attributes. Measures of association for two way classified data. Consistency and independence of data with special reference to attributes. Coefficient of colligation.

## Practical

1. Calculations of mean, median, mode, range and quartile deviation.
2. Calculations of mean deviation, standard deviation and coefficient of variation.
3. Calculations of moments, kurtosis and skewness.
4. Calculations of partial and multiple correlations.
5. Fitting of regression line.

### Mark distribution of practical for end semester examination

1. Experiment 1	5
2. Experiment 2	5
3. Minor experiment	3
4. Laboratory record	3
5. Viva voce	4
TOTAL	20

### Suggested readings

1. Bhat B.R., Srivenkataramana T. and Rao Madhava K.S. (1996): Statistics, A Beginner's Text, Vol. I and II, New Age International (P) Ltd.
2. Goon A.M., Gupta M.K. and Das Gupta B. (1991): Fundamental of Statistics, Vol. I, World Press, Calcutta.
3. Hogg R.V. and Craig A.T. (1972): Introduction to mathematical Statistics, Amerind Publishing Co.
4. Hoel P.G. (1971): Introduction to Mathematical Statistics, Asia Publication.
5. Kapoor, V.K. and Saxena, H.C. : Mathematical Statistics.

# Probability Theory

STAMJ/101

Credits: 4 (Theory)

- Unit 1 Random experiment: Trial, sample point, sample space, definitions of equally-likely, mutually exclusive and exhaustive events, definitions of probability, classical and relative frequency approach to probability, axiomatic approach to probability and its properties, merits and demerits of these approaches, total and compound probability, conditional probability theorems, independence of events, Bayes theorem and its applications.
- Unit 2 Random variables, two-dimensional random variables, discrete and continuous, Discrete random variable: probability mass function and distribution function, joint probability mass function of several discrete random variables, marginal and conditional probability mass functions, independence of random variables.
- Unit 3 Continuous random variable: Probability density function, distribution function, joint density function of two continuous variables, marginal and conditional probability density functions. Expectation of random variable and its properties, conditional expectation.
- Unit 4 Moment in terms of expectation, moment generating function and cumulant generating function of a random variable, their properties and uses, Tchebycheff's inequality and its applications. Statements of weak law of large numbers and central limit theorems.

## Suggested readings

1. Meyer P.L. (1970): Introductory Probability and Statistical Applications, Addison Wesley.
2. Mood A.M., Greybill, F.A. and Bose D.C. (1974): Introduction to the Theory of Statistics, McGraw Hill.
3. Hogg R.V. and Craig A.T. (1972): Introduction to Mathematical Statistics, Amerind Publishing Co.
4. Parzen E. (1960): Modern Probability Theory and its Applications, Wiley Eastern.
5. Rohtagi V.K. (1967) : An Introduction to Probability Theory and Mathematical Statistics, John Wiley and Sons.