

MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WB
Syllabus of B. Sc. In Statistics
(Effective for 2021-2022 Admission Session)
Choice Based Credit System
140 Credit (3-Year UG) MAKAUT Framework
w.e.f 2021-22

Detailed Syllabus for Semester I

BSTAT 101 Descriptive Statistics

Course Outcome:

After completion of the course the students will be able to

1. To learn the basics of data handling, data representation, descriptive measures and exploratory analysis
2. To apply mathematical ideas into statistical data analysis. Interpreting
3. To perform data analysis based on the statistical measures and interpreting the outcomes of the study
4. To learn the interrelationship between location, scale and shape problems of data distribution and situational application of various statistical measures
5. To understand the mechanism of statistical decision making through exploratory data analysis
6. To collect real data from field of enquiry and prepare complete analytical findings of inner stories of a situation.

UNIT I

Statistical Methods: Definition and scope of Statistics, concepts of statistical population and sample. Data: quantitative and qualitative, attributes, variables, scales of measurement- nominal, ordinal, interval and ratio. Presentation: tabular and graphical, including histogram and ogives, consistency and independence of data with special reference to attributes.

UNIT II

Measures of Central Tendency: mathematical and positional. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation, Moments, absolute moments, factorial moments, skewness and kurtosis, Sheppard's corrections.

UNIT III

Bivariate data: Definition, scatter diagram, simple, partial and multiple correlation (3 variables only), rank correlation. Simple linear regression, principle of least squares and fitting of polynomials and exponential curves.

UNIT IV

Index Numbers: Definition, construction of index numbers and problems thereof for weighted and unweighted index numbers including Laspeyre's, Paasche's, Edgeworth-

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Marshall and Fisher's. Chain index numbers, conversion of fixed based to chain-based index numbers and vice-versa. Consumer price index numbers.

SUGGESTED READING:

1. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata.
2. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
3. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn., (Reprint), Tata McGraw-Hill Pub. Co. Ltd.

BSTAT 191 Descriptive Statistics Laboratory

List of Practical (At least 10)

1. Graphical representation of data.
2. Problems based on measures of central tendency.
3. Problems based on measures of dispersion.
4. Problems based on combined mean and variance and coefficient of variation.
5. Problems based on moments, skewness and kurtosis.
6. Fitting of polynomials, exponential curves.
7. Karl Pearson correlation coefficient.
8. Correlation coefficient for a bivariate frequency distribution.
9. Lines of regression, angle between lines and estimated values of variables.
10. Spearman rank correlation with and without ties.
11. Partial and multiple correlations.
12. Planes of regression and variances of residuals for given simple correlations.
13. Planes of regression and variances of residuals for raw data.
14. Calculate price and quantity index numbers using simple and weighted average of price relatives.
15. To calculate the Chain Base index numbers.
16. To calculate consumer price index number.

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BSTAT 102 Basic Probability

Course Outcome:

After completion of the course the students will be able to

1. Understand the idea of deterministic experiment and random experiment.
2. Apply the concept of probability as measure of uncertainty in practical cases
3. Understand the idea of prior, posterior and bayes theorem
4. Learn the idea of random variables.

UNIT I

Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability – classical, statistical, and axiomatic. Conditional Probability, laws of addition and multiplication, independent events, Theorem of total probability, Bayes' theorem and its applications.

UNIT II

Random variables: discrete and continuous random variables, p.m.f, p.d.f. and c.d.f., illustrations and properties of random variables. Expectation and variance of random variable.

UNIT III

Jensen's Inequality, Cauchy Schwarz Inequality, Markov's inequality, Chebyshev's Inequality, Chernoff's Inequality, One Sided Chebyshev's Inequality.

References

1. Chung K.L. (1983): Elementary Probability Theory with Stochastic Process, Springer / Narosa
2. Feller W. (1968): An Introduction to Probability Theory & its Applications, John Wiley
3. Goon A.M., Gupta M.K. & Dasgupta B. (1994): An Outline of Statistical Theory (Vol-1), World Press
4. Rohatgi V.K. (1984): An Intro. to Probability Theory & Math. Statistics, John Wiley
5. Hoel P.J., Port S.C. & Stone C.J.: Introduction to Probability Theory (Vol-1), Mifflin & UBS
6. Cramer H. (1954): The Elements of Probability Theory, John Wiley
7. Parzen E. (1972): Modern Probability Theory and its Applications, John Wiley

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BSTAT 104 Communicating English

Course Outcome:

After completion of the course the students will be able to

1. Talk in English so that he/she could express their views on any topic without any difficulty in speech.
2. Use English effectively during the entire course curriculum and enable the learner to communicate effectively and appropriately in real life situation.
3. Develop and demonstrate the speaking skills for group discussions.

Module 1

Small Talk & Conversational, Vocabulary; Express Yourself: Pronunciation; Elevator Speech

Module 2

Video Conferencing: Face to Face but Online; Group Discussion Language; Video

Conference Role Play

Module 3

Telephone Language; Understand and Be Understood on the Phone; Phone Role Pla

Module 4

Get Ready for the Interview; Improve Your Pronunciation

References:

1. S R Inthira& V Saraswathi, Enrich your English a) Communication skills b) Academic skills, CIEFL & OUP
2. R.C. Sharma and K.Mohan Business Correspondence and Report Writing Tata McGraw Hill , New Delhi , 1994
3. Maxwell Nurnberg and Rosenblum Morris, All About Words- A Text Book for English for Engineers & Technologists General Book Depot, New Delhi, 1995