Proforma for course plan

Course Name: **Introduction to Probability and Statistics**
Course Code: 402
Credit: 3 Credits
Course offered to: M.Sc (Sem-I)

Course description: This course provides an elementary introduction to probability and statistics with applications. Topics include: basic combinatorics, random variables, probability distributions, Bayesian inference, hypothesis testing, confidence intervals, estimations, sampling distributions and linear regression. The concepts of this paper are widely useful in all types of sciences. This may include some kind of internal assessments interms of assignments/group presentations of data analysis and real life applications of probability concepts using some statistical softwares (Excel/SPSS/R etc.)

Pre-requisites: Compulsory for all M.Sc. Semester-I students

Course Outcome(s) (CO): At the end of the course, the students will be able to apply

1. Knowledge of probability and statistical concepts
2. Students learn statistical methodologies and technologies in analyzing and interpreting various real world data.
3. Formulating sampling hypothesis and testing.
4. Fitting regression and correlation models.

Tentative plan:

Week number	**Lecture topic**	CO met
1-2	Basic concepts of descriptive statistics; Probability: Probability Axioms, Conditional Probability and Bayes' Theorem.	CO-1
3-6	Random Variables and their Probability Distributions. Characteristic Function. Multidimensional Random Variable: Joint, Marginal and Conditional Distributions, Independent Random Variables, Functions of Several Random Variables, Order Statistics.	CO-2
7-11	Discrete and Continuous Distributions (such as uniform, binomial etc.), Sampling distributions: Weak Law of Larger Numbers, Central, Limit Theorem; Concepts of Random Sampling. Sample Characteristics. Exact Sampling Distributions: Chi-Square, t, F Distributions	CO-3
12-14	Estimation of Parameters: Testing of Hypotheses Linear Regression and Correlation models.	CO-4

Text Books and References

Freund, J.E., Mathematical statistics, Eastern Economy Edition.
Mann, Introductory Statistics, Hoboken, N.J. Wiley.

Goon, A.M., Gupta, A.K and Dasgupta, B., An Outline of Statistical Theory, vol-I, world Press Pvt. Ltd.

Hogg, R. V., A. Craig, and J. W. McKean. Intro to Mathematical Statistics.

Larsen, Richard J. and Marx, Morris L. "An Introduction to Mathematical Statistics and Its Applications" (2012). Prentice Hall.

Related articles from journals

Related topics from authentic sources