Gujarat Technological University

B.Pharm Semester-II

Applied Mathematics (Biostatistics)

(2 hours/week; 2 credits, 30 hours)

1. **Sample and sampling methods** **06**
   Introduction, sample and population, importance of sampling, sample and its characteristics. Sampling methods - Simple random sampling – lottery method and random number tables; stratified random sampling; systematic sampling; multistage sampling; cluster sampling. Sampling with and without replacement, sampling distribution, standard error. Example of – simple random sample and stratified random sampling.
2. **Statistical inference – tests of hypothesis** **08**
   Introduction, testing of hypothesis – hypothesis, statistical hypothesis, null hypothesis, alternative hypothesis, test of a hypothesis, critical region, types of errors in testing of a hypothesis, level of significance, two-tailed and one-tailed tests, degrees of freedom. Tests of significance – large sample tests; small sample tests – t-test for testing the significance of a single mean, t-test for testing the significance of difference between two means, paired t-test. T-test for testing the significance of an observed correlation coefficient, F-test for equality of two variances, Chi-square test for goodness of fit, Chi-square test for testing independence of attributes, Chi-square test for homogeneity. Example for all types of tests.
3. **Correlation and Regression** **04**
   Introduction, types of correlation – positive or negative, simple, multiple or partial. Coefficient of correlation, methods of studying correlation – scatter diagram method, karl pearson's product moment method, spearman's rank correlation method. Regression, lines of regression, methods of finding regression lines - scatter diagram method, method of least squares. Examples of all methods for correlation and regression.
4. **Analysis of variance** **04**
   Introduction, assumptions of analysis of variance, analysis of variance for oneway classification, analysis of variance for two-way classification. Example of one-way and two-way classifications.
5. **Non-parametric tests** **04**
   Introduction, advantages of non-parametric tests, the wilcoxon signed-rank test, the wilcoxon rank-sum test, the kruskal-wallis test. Example of all three non-parametric tests.
6. **Experimental designs in clinical research** **04**
   Introduction, types of designs – parallel design, cross-over design – two-way cross-over and three-way cross-over, Replicate design. Merits and demerits of all methods. Wash-out period, carry-over effect.

NOTE: PLEASE COVER PHARMACY APPLICATION RELATED EXAMPLES FOR ALL TOPICS.

Books recommended:

1. Business statistics **-** J K Sharma, PHI publication.
2. Statistical methods - S P Gupta, Sultan Chand & Sons.