

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PHARM.D**  
4<sup>th</sup> Year

**Subject Name: Biostatistics & Research Methodology**  
**Subject Code: 848804**

**Detailed syllabus:**

Sr.	Topic	Hr
<b>Research Methodology</b>		
1.	a) Types of clinical study designs: Case studies, observational studies, interventional studies, b) Designing the methodology c) Sample size determination and Power of a study Determination of sample size for simple comparative experiments, determination of sample size to obtain a confidence interval of specified width, power of a study d) Report writing and presentation of data	
<b>Biostatistics</b>		
2.	a) Introduction b) Types of data distribution c) Measures describing the central tendency distributions- average, median, mode d) Measurement of the spread of data- range, variation of mean, standard deviation, variance, coefficient of variation, standard error of mean	
3.	<b>Data graphics</b> Construction and labeling of graphs, histogram, piecharts, scatter plots, semilogarithmic plots	
4.	<b>Basics of testing hypothesis</b> a) Null hypothesis, level of significance, power of test, P value, statistical estimation of confidence intervals. b) Level of significance (Parametric data)- students t test (paired and unpaired), chi Square test, Analysis of Variance (one-way and two-way) c) Level of significance (Non-parametric data)- Sign test, Wilcoxon's signed rank test, Wilcoxon rank sum test, Mann Whitney U test, Kruskal-Wallis test (one way ANOVA) d) Linear regression and correlation- Introduction, Pearson's and Spearman's correlation and correlation co-efficient. e) Introduction to statistical software: SPSS, Epi Info, SAS	
5.	<b>Statistical methods in epidemiology</b> Incidence and prevalence, relative risk, attributable risk	
6.	<b>Computer applications in pharmacy</b> Computer System in Hospital Pharmacy: Patterns of Computer use in Hospital Pharmacy – Patient record database management, Medication order entry – Drug labels and list – Intravenous solution and admixture, patient medication profiles, Inventory control, Management report & Statistics. Computer In Community Pharmacy Computerizing the Prescription Dispensing process Use of Computers for Pharmaceutical Care in community pharmacy Accounting and General ledger system Drug Information Retrieval & Storage : Introduction – Advantages of Computerized Literature Retrieval Use of Computerized Retrieval	

**Reference Books:**

1. Pharmaceutical statistics- practical and clinical applications, Sanford Bolton 3rd edition, publisher Marcel Dekker Inc. NewYork

2. Drug Information- A Guide for Pharmacists, Patrick M Malone, Karen L Kier, John E Stanovich ,  
3rd edition, McGraw Hill Publications 2006