St.James College of Pharmaceutical Sciences St.James medical Academy River Bank, Chalakudy			
Programme:	pharmd	Sem.:	fourth
Name of Course: (*Subject*)	Biostatistics and research methodology	Course Code:	
Teaching faculty of the course	Dr.alfet raju anthraper		

Summary of the Lecture Plan

Topic	Lectures	Hours
Research Methodology	Types of clinical study designs	9
	Designing the methodology	6
	Sample size determination	3
	Power of a study	1
	Report writing	3
	presentation of data	2
Biostatistics	Introduction	1
	Types of data distribution	1
	central tendency distributions	3
	Measurement of the spread of data	5
Data graphics	Construction and labeling	2
Basics of testing hypothesis	Null hypothesis	3
	level of significance	1
	power of test, P value	1
	Parametric data	4
	Non-parametric data	4
	Linear regression and correlation	2
	statistical software	3
Statistical methods in epidemiology	Incidence and prevalence	1
	relative risk	1
	attributable risk	1
Computer applications in pharmacy	Computer System in Hospital Pharmacy	8
	Computer In Community Pharmacy	3
	Drug Information Retrieval & Storage	1

Major issues or Core aspects to be addressed/ covered:

Research Methodology
Types of clinical study designs: Case studies, observational studies, interventional
studies, Designing the methodology . 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
Report writing and presentation of data

Biostatistics
Introduction, Types of data distribution, Measures describing the central tendency of
distributions- average, median, mode, Measurement of the spread of data-range,
variation of mean, standard deviation, variance, coefficient of variation, standard error
mean.
Data graphics
Construction and labeling of graphs, histogram, piecharts, scatter plots,
semilogarthimic plots.
Basics of testing hypothesis
Null hypothesis, level of significance, power of test, P value, statistical estimation of
confidence intervals. Level of significance (Parametric data)- students t test (paired and
unpaired), chi Square test, Analysis of Variance (one-way and twoway) . Level of
significance (Non-parametric data)- Sign test, Wilcoxan's signed rank test, Wilcoxan
rank sum test, Mann Whitney U test, Kruskal-Wall is test (one way ANOVA) . Linear
regression and correlation- Introduction, Pearsonn's and Spearmann's correlation and
correlation co-efficient. Introduction to statistical software: SPSS, Epi Info, SAS
Statistical methods in epidemiology
Incidence and prevalence, relative risk, attributable risk
Computer applications in pharmacy
Computer System in Hospital Pharmacy: Patterns of Computer use in Hospital and list –
Pharmacy – Patient record database management, Medication order entry – Drug labels
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

Sample Questions

Research Methodology
Explain the different types of clinical study designs.
Describe case study with its merits and demerits .
Describe observational studies with its merits and demerits
Describe interventional studies with its merits and demerits
Describe the different types of research.
Explain the steps in research methodology.
Determine the sample size with respect to mean.
Explain the factors affecting sampling.

Describe the different types of sampling with examples.
What is power of a study
Explain the steps in report writing.
How to present data.
Biostatistics
Define Biostatistics and its applications.
Explain the types of data distribution.
Describe the central tendency distributions.
Narrate on different types of mean with equations and examples
Narrate on different types of median with equations and examples
Narrate on different types of mode with equations and examples
Describe the spread of data.
Narrate on range with equations and examples
Narrate on variation of mean with equations and examples
Narrate on standard deviation with equations and examples
Narrate on variance with equations and examples
Narrate on coefficient of variation with equations and examples
Narrate on standard error of mean with equations and examples
Data graphics
Explain the different types of graphs with suitable examples.
Basics of testing hypothesis
Explain the null hypothesis.
Describe students t test (paired) with its merits and demerits, equations and examples
Describe students t test (un paired) with its merits and demerits equations and
examples.
Describe chi Square test with its merits and demerits, equations and examples
Describe Analysis of Variance (one-way)with its merits and demerits, equations and
Examples.
Describe Analysis of Variance (two-way) with its merits and demerits, equations and
Examples.
Describe Sign test with its merits and demerits, equations and examples
Describe Wilcoxan's signed rank test with its merits and demerits, equations and
examples
Describe Wilcoxan rank sum test with its merits and demerits, equations and examples
Describe Mann Whitney U test with its merits and demerits, equations and examples
Describe Kruskal-Wall test with its merits and demerits, equations and examples
Describe Linear regression with its merits and demerits, equations and examples

Describe Pearsonn’s and Spearmann’s correlation with its merits and demerits,
equations and examples.
Describe SPSS with its merits and demerits
Describe Epi Info with its merits and demerits
Describe SAS with its merits and demerits
Statistical methods in epidemiology
Explain the Statistical methods in epidemiology
Computer applications in pharmacy
Explain the Computer System in Hospital Pharmacy.
Explain the Patient record database management
Explain the Medication order entry
Explain the Drug labels
Explain the Intravenous solution and admixture
Explain the patient medication profiles
Explain the Inventory control
Explain the Management report & Statistics
Explain the Accounting and General ledger system
Explain the Drug Information Retrieval & Storage
Explain the Advantages of Computerized Literature Retrieval
Explain the Use of Computers for Pharmaceutical Care in community pharmacy.