



The Islamia University of Bahawalpur

Rahim Yar Khan Campus
Department of Statistics

Class: **BS Statistics**

Semester: **3rd**

Season: **Spring 2019-23**

Instructor	Muhammad Riaz	E-Mail: muhammad.riaz@iub.edu.pk
Course Title	Basic Statistical Inference	Program BS STAT
Course Number	STAT-01301	Credit Hours 3
Lecture Timings	Monday (11:30 am to 02:30 pm)	

Course Objectives:

1. To understanding of basic techniques of sampling and estimation, their properties and application.
2. To select a sample from a given population and use it to make inferences about the population and its parameter.
3. To test, deduce and infer the validity of different types of hypotheses and models built on the basis of the raw data collected in diverse problem-situations.

Course Outline

Week	Topics
	Mid Term
1,2	Population, statistical population, finite and infinite population, target population, size of population, sample, size of sample, sampling, sampling unit, sampling technique, purpose of sampling, parameter, statistics, standard error, uses of standard error, with and without replacement , Sampling distribution: concepts and properties, and numerical problems.
3,4	Probability and non probability sampling, sampling frame, sampling design, sampling distribution, sampling error, non sampling error, bias, simple random sampling and its methods, finite correction factor, advantages of sampling, unbiasedness, uses of sampling in daily life, precision and accuracy, central limit theorem and numerical problems
5,6	Sampling distribution of sample mean, proportion, difference between means, difference between proportions, Sampling distribution of biased variance, Sampling distribution of unbiased variance and numerical problems.
7,8	Estimation, estimation of parameter, point and interval estimation, estimate, interval estimate, interval, confidence interval, confidence coefficient, confidence limit, error of estimation, properties of good estimator, Interval Estimation of population mean. Large and small sample confidence intervals for Population Mean, difference between two means, proportion, difference between two proportions, estimation of sample size and numerical problems.
	Final Term Exam
9,10	Hypothesis, simple and composite hypothesis, testing of hypothesis, exact and inexact hypothesis, null and alternative hypothesis, type I error, type II error, comparison b/w α and β , one tailed test, two tailed test, Acceptance and rejection region, test statistics, level of significance, level of confidence, critical value, power of test, power of curve and numerical questions.
11,12	Inferences for population mean, two population Means, for large-sample, inferences for two populations using Independent Samples and numerical problems.
13,14	Inferences for population Proportion, Two population Proportions, for large-sample numerical problems.
15,16	Inferences for Population Mean, Two Population Means for small sample, inferences for Two Populations using Independent Samples, Inferences for the Mean of Two Normal Populations using Independent Samples (variances are assumed Equal/Not Equal). Inference for Two Populations Mean using Paired Samples.

Course presentations:

A brief introduction of the topic will be given by the course instructor followed by the PowerPoint presentation by the student/group of about 20 minutes. A further 20-30 minutes would be devoted to the discussion, objection or questions related with the topic. The PowerPoint copy of the presentation must be e-mailed or a hard copy submitted to the instructor at least 24 hours before the presentation.

Teaching Methodology:

1. The class will be conducted in the form of lecture and discussion. Students will be encouraged to participate and ask question at the end of each class session.
2. Students are also expected to read the topic of the day in advance which will be told a day before by the instructor.

Testing and Grading:

1. Grading will tend to focus on your overall performance rather than on or two aspects. A mid-term examination and a comprehensive final examination will be given.
2. The mid-term examination will be graded for 30 marks and final examination will have a value of 50 marks.
3. At least 80% attendance is mandatory.
4. Test question may be taken from textbook reading, additional material discussed in the class and / or other assigned readings.

Marks Distribution:

Activity	Marks
Classroom participation/general behavior/group work	5
Quiz/surprise test	5
Assignments	5
Presentation/Seminar	5
Mid-term Exam	30
Final Exam	50
Total	100

Student Responsibilities

- i) Students must attend class. At least 80% attendance is mandatory. Students are also responsible for doing all assigned work on time.
- ii) Students must also arrive on time and remain in class for the entire period.
- iii) Cellular Phones and Beeper must be turned off.
- iv) Test question may be taken from textbook reading, additional material discussed in the class and / or other assigned readings.
- v)

Recommended Books:

1. Chaudhry, S.M. and Kamal, S. (2008), “*Introduction to Statistical Theory*” Part I, II, 8th ed, Ilmi Kitab Khana, Lahore, Pakistan.
2. Clark, G.M. and Cooke, D. (1998), “*A Basic Course in Statistics*” 4th ed, Arnold, London.
3. Mclave, J.T., Benson P.G. and Snitch, T. (2005) “*Statistics for Business & Economics*” 9th Prentice Hall New Jersey.
4. Spiegel, M.R., Schiller, J.L. and Sirinivasan, R.L. (2000) “*Probability and Statistics*”, 2nd ed. Schaums Outlines Series. McGraw-Hill. NY.
5. Walpole, R.E., Myers, R.H. and Myers, S.L. (2007), “*Probability and Statistics for Engineers and Scientist*” 7th edition, Prentice Hall, NY.
6. Weiss, N.A. (1997), “*Introductory Statistics*” 4th ed. Addison-Wesley Pub. Company, Inc.