

STAT319: PROBABILITY & STATISTICS FOR ENGINEERS & SCIENTISTS
Lab Syllabus Semester: 162

Instructor:

Office: Building: Room: Phone: Email:

Office Hours:

Check Blackboard regularly for announcements

Objectives:

This Lab of STAT 319 is designed to help the students in the following ways:

1. To easily understand and appreciate the practicability of the concepts taught in the STAT 319 curriculum.
2. To develop their ability to properly analyze and solve probability and statistics problems, and reasonably interpret their results.
3. To learn how to use STATISTICA in solving a wide range of statistical problems in real world, since statistics has a lot of application in almost all the fields of life.

Assessment

Assessment for this Lab will be based on lab work, participation, attendance, and three lab tests, as following:

Activity	Weight	Marks
Attendance and Lab Participation	25%	5
3 Lab Tests	75%	15
Total	100%	20

Resources

Students must bring the Lab Manual with them to every lab session.

Suggested Class work and Tutorial Problems

Students are encouraged to do the problems in the Lab first by hand and then by using Statistica for the comparison of results.

Syllabus, weekly coverage of material and lab tests schedule

Week	Topic	Section
Week 01 Feb 5 – 9	No Labs	
Week 02 Feb 12 – 16	Introduction to STATISTICA: Creating a new data sheet, Naming the variables, Saving and retrieving file types, Copying results into text. Random Number Generation: Drawing simple random samples by a table of random number and by STATISTICA.	1.1-1.2 2.1-2.2
Week 03 Feb 19 – 23	Descriptive Statistics: Graphical description (Manually & by Statistica) Stem and Leaf Plot, Frequency table, Shapes of distributions, Histogram, Frequency plot, Frequency polygon, Bar chart and Pie chart.	2.3-2.6
Week 04 Feb 26 – Mar 2	Descriptive Statistics: Numerical Measures: (Manually & by Statistica) Common measures of location: Mean, Median, Mode. Common Measures of variation: Range, Variance, Standard Deviation.	2.7-2.8
Week 05 Mar 5 - 9	Descriptive Statistics: (Continues) Percentiles, Quartiles, Empirical Rule, Coefficient of Variation and Skewness, Proportion. Box-plot, approximate Mean and Variance for Grouped data.	2.8-2.10
Week 06 Mar 12 - 16	Catch up and Lab test 1 – Material Covered: from beginning to end of week 5	LAB TEST 1
Week 07 Mar 19 - 23	Discrete Probability Distributions: Binomial, Geometric, Hypergeometric, & Poisson Distributions	3.1-3.4
Week 08 Mar 26 - 30	Continuous Probability Distributions: Normal distribution, t, F, Chi-Square, Exponential, and other distributions	4.1,4.4 5.4-5.5
April 2 – 6 Midterm Break		
Week 09 Apr 9 – 13	Sampling Distributions of Sums and Means and the Central Limit Theorem Normal Approximation to the Binomial Distribution Drawing a Random Sample from a known Distribution	5.1-5.3
Week 10 Apr 16 – 20	Catch up and Lab test 2 – Material Covered: Discrete, Continuous & Sampling Distributions	LAB TEST 2
Week 11 Apr 23 – 27	Confidence Intervals and Testing for a single sample Population Mean and Population Proportion	6. 1-6.3,6.5 7.1
Week 12 Apr 30 – May 4	Simple Linear Regression and Correlation Scatter diagram, Correlation coefficient, Estimating the line of best fit, Sources of variation, Checking the model assumptions	8.1-8.4
Week 13 May 7 - 11	Confidence Interval estimation of regression parameter, Prediction Interval (PI) for a future observation y_o , Testing the slope of the regression line	8.5-8.9
Week 14 May 14 - 18	Multiple Linear Regression Multiple Linear Regression Model, Hypothesis Tests in Multiple Linear Regression, Confidence Intervals in Multiple Linear Regression, Prediction of New Observations, Residual Analysis	8.10
Week 15 May 21 - 25	Lab test 3 – Material Covered: Estimation, Testing and Regression.	LAB TEST 3