STAT 107: Survey of Statistics

On completing the course students will be able to perform the tasks indicated below at the survey of statistics level using appropriate technology in statistical computing.

1. **Fundamental Ideas**: Distinguish between descriptive and inferential statistics. Distinguish between observational and experimental studies.
2. **Data and Data Collection**: Distinguish between populations and samples, and the various types of variables, types of data, and levels of measurement. Distinguish between the various sampling techniques.
3. **Data Organization, Displays and Summaries**: Organize data into appropriate frequency distributions. Construct and interpret graphical displays of data, including Pie and Pareto Charts, histograms and boxplots, scatterplots. Compute and interpret measures of central tendency, spread, and position.
4. **Probabilities**: Distinguish between classical and empirical probability. Use appropriate probability rules to compute and interpret results. Apply counting rules for combinations and permutations.
5. **Probability Distributions**: Distinguish between discrete and continuous probability distributions, and apply the central limit theorem as appropriate. Compute and interpret probabilities from binomial, normal, and Student’s t-distributions.
6. **Interval Estimates and Tests for Population Parameters**: Compute confidence intervals for population means and proportions. Correctly state hypotheses and apply methods appropriate for single of population means and proportions. Note: The traditional method, or the p-value method, or both may be used.
7. **Correlation and Regression**: Conduct a simple regression (and correlation) analysis. This includes fitting data to a simple regression model and using the fitted model in predictions.
STAT 273: Elementary Statistics

On completing the course students will be able to perform the tasks indicated below at the elementary statistics level using appropriate technology.

1. **Fundamental Ideas**: Distinguish between descriptive and inferential statistics; and observational, experimental and quasi-experimental studies. Design a statistical study.
2. **Data and Data Collection**: Distinguish between populations and samples, and the various types of variables, types of data, and levels of measurement. Distinguish between, and apply the various sampling techniques.
3. **Data Organization, Displays and Summaries**: Organize data into appropriate frequency distributions. Construct and interpret graphical displays of data, including Pie and Pareto Charts, histograms and boxplots, scatterplots. Compute and interpret measures of central tendency, spread, and position.
4. **Probabilities**: Distinguish between classical and empirical probability. Identify and/or perform probability experiments and use appropriate probability rules to compute and interpret results.
5. **Probability Distributions**: Distinguish between discrete and continuous probability distributions, and apply the central limit theorem as appropriate. Compute and interpret probabilities and quantiles from binomial, normal, t-, chi-square and F-distributions.
6. **Interval Estimates and Tests for Population Parameters**: Compute confidence intervals for population means, variances and proportions. Correctly state hypotheses and apply methods appropriate for single and two-sample tests of population means, variances, and proportions. Correctly state and perform a one-way ANOVA to compare three or more population means. Correctly interpret results. Note: The traditional method, or the p-value method, or both may be used and the “z-test for population means” may be considered optional.
7. **Nonparametric Methods for Categorical Data**: Correctly state hypotheses for contingency table chi-square tests and correctly interpret results. Note: The traditional method, or the p-value method, or both may be used.
8. **Correlation and Regression**: Conduct a simple regression (and correlation) analysis. This includes fitting data to a simple regression model, testing the significance of the model (or the correlation coefficient), and using the fitted model in predictions.