Course Title: Elementary Statistics
Course No. MAT 117 No. of Credits 3
Contact hrs/wk: Lecture 3 Lecture/Discussion 2 Lab 1
Course Prerequisites Grade of C or better in MAT 105 or MAT 108 or equivalent

Catalog description:
The primary aim of the course is a basic understanding and use of statistical concepts and methods to facilitate study and research in other disciplines. Includes measures of central tendency, measures of variability, grouped data, the normal distribution, central limit theorem, hypothesis testing, estimation, T-distribution and Chi-square test.

Course content (list of topics normally covered):
- Descriptive Statistics:
  - Histograms – Bar Charts – Time series graphs
  - Measures of central tendency – mean and median
  - Measures of dispersion – Range, Inter-quartile Range – standard deviation –
  - Types of distributions – Skewed, Uniform, Normal
  - Standard Normal distribution
  - Areas under the normal curve - Percentiles
  - Exploratory Data Analysis – stem and leaf and box plots

- Correlation and Regression
  - Scatter diagrams
  - Positive and negative association
  - Linear Correlation Coefficient
  - Estimation and line of best fit.

- Producing Data:
  - Simple random sample – other sampling ideas
  - Observational studies – surveys
  - Cautions about surveys
  - Designing Comparative Experiments

- Probability and Sampling Distribution
  - Understanding Randomness and Probability
  - Basic concepts – Probability models
  - Assigning of probabilities – Discrete and continuous
  - Sampling Distributions of mean
  - Mean and standard deviation of sampling distribution of mean
  - Central Limit Theorem

- Introduction to Inference
  - Statistical Confidence
  - Confidence Intervals (for mean and proportion)
  - Behavior of confidence intervals
- Tests of Significance (for mean and proportion)
- Notion of P-value – significance levels
- Comparing two samples – paired and unpaired tests
- Multiple comparisons/ two way tables – Chi Square test

**Content-based department proficiencies:**

The successful student will be able to:
- perform basic analysis of data: Descriptive statistical measures and Charting
- calculate basis probabilities
- interpret data with confidence intervals
  - mean and proportions
- do hypothesis testing
  - means and proportions of single populations
  - comparing means and proportions of two populations
  - multiple comparisons (proportions of several populations)

**Colleges-wide proficiencies assigned to course:**

Students should be able to demonstrate the following:

**A. Analytical skills**Performance Indicators: Students should be able to:
1. Interpret and synthesize information and ideas.
4. Select and apply scientific and other appropriate methodologies.

**B. Quantitative skills**Performance Indicators: Students should be able to:
1. Solve quantitative and mathematical problems.
2. Interpret graphs, tables, and diagrams.

**Representative textbooks used for the courses:**
- Understanding Statistics – Braise & Braise
- Elementary Statistics – Larson & Farber
- Elementary Statistics, A Step by Step Approach - Bluman 4/e
- Interactive Statistics – Aliaga and Gunderson
- Elementary Statistics – Johnson 8/e
- Workshop Statistics, Data and Minitab - Rossman & …
- The Basic Practice of Statistics - David Moore 2/e

*Approved April 22*