Based on ABET CAC Student Learning Outcomes

1. **Course Number and Name:**
   ENGT 3010 Applied Statistics & DOE
2. **Credits and Contact hours:**
   Credits: 4 hours, Contact: 4 lecture hours
3. **Instructor's or course coordinator's name:**
   Cyrus Hagigat
4. **Text book, title, author, and year:**
   Statistics for Engineers, Navidi, 2019, 5th Edition
   a. **Other supplemental materials:**
      Software: Minitab 15 & 16
5. **Specific Course Information:**
   a. **Brief description of the content of the course (catalog description):**
      This course is an introduction to applied probability, statistical inference, and design of experiments. Topics include discrete and continuous probability distributions, confidence intervals, tests of hypotheses, linear regression and correlation, analysis of variance, factorial experimental designs, and propagation of measurement uncertainty. MINITAB interactive statistical and graphical software will be utilized for data display and analysis.
   b. **Pre-requisites, or co-requisites:**
      ENGT-3020 Applied Engineering Math
6. **Specific goals for the course:**
   a. **Specific outcomes of instruction:**
      1. Establish frequency distributions
      2. Distinguish between populations and samples
      3. Calculate measures of central tendency, such as the mean, median or mode
      4. Calculate measures of dispersion, such a standard deviation, variance or skewness
      5. Understand basic concepts of probability
      6. Utilize binomial and Poisson probability distributions
      7. Utilize normal probability distributions
      8. Utilize distribution of sample means
      9. Perform Chi-square tests
      10. Establish confidence intervals
      11. Test hypotheses
      12. Perform correlation analysis
      13. Perform linear regression analysis
      14. Understand multiple linear regression analysis
      15. Perform various nonparametric tests
      16. Utilize the MINITAB computer program

17. Perform experimental design

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course:

1. An ability to analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

3. An ability to communicate effectively in a variety of professional contexts.

Brief list of topics to be covered:

1. Probability
2. Histograms
3. Stem-and-leaf displays
4. Boxplots
5. Discrete random variables
6. Binomial distribution
7. Poisson distribution
8. Continuous random variables
9. Normal distribution
10. Chi-square distribution
11. Random behavior of means
12. Normal approximation to binomial
13. Confidence intervals
14. Test of hypothesis
15. p-value
16. Simple linear regression
17. Multiple linear regression
18. Residual analysis
19. 22 factorial design
20. 2k factorial design