Department of Engineering Technology ET-302

Course Number and Name: ET 302, Manufacturing Data Analysis

Credits & Contact Hours

Credits	Lectures	Lab	Semester Contact Hours
3.0	(3) 50 min lectures per week	None	45

Instructors Name: Manuel Gomez

Textbook title, *Statistical Methods for Engineers, 3rd edition*
author and year: by Geoffrey Vining & Scott M. Kowalski, 2011

Specific Course Information:

a. **Course Catalog Description** – Methods for analyzing data collected during manufacturing processes. Emphasis placed on production control utilizing results of statistical methods and design of experiments.
b. **Prerequisites:** Math 235 (Calculus I).
c. This course is required for MET, CET, ECET, IET degrees

Course Goals & Objectives: Students will gain an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines; including:

- methods for data collection and analysis for manufacturing processes
- graphical analysis for manufacturing data
- probabilistic modeling and descriptive statistics
- variability and distribution for the data
- methods used for formal estimation
- basic statistical concepts for manufacturing process monitoring using control charts
- basic statistical concepts for analyzing formal experiments (Design of Experiments)
- applied Six Sigma as used in Industry
- Minitab statistical software and Mathcad analysis software

Related ABET Objectives & Outcomes: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline, to include the following:

Student Outcomes of Instruction from MET (x.)	Student Outcomes/ Criteria 3
(1.) **Algebra**, trigonometry, Boolean mathematics, calculus, **statistics and probability**, fundamental principles and concepts of science and engineering technology**, good practice in problem solving**, and methods of standard practice in the analysis and applied design of mechanical systems	3.a, 3.b, 3.c, 3.f, 3.k
(4**.) Current software corresponding to good practice in the application of mechanical engineering technologies**. Software application functions to include: word processing, spreadsheet calculations, **graphing, presentation media**, computer assisted drafting and manufacturing**,** manufacturing processes, **statistics**, data acquisition, **project management**, and the analysis and applied design of systems involving mechanisms, machines, or fluid thermal processes.	3.a, 3.b, 3.c

Week of	Chapter Topic	Contact Hours
Jan 10	Course Introduction & overview	1
17	Mathcad, Minitab overview	3
24	Statistics in Industry, What is Six Sigma?	3
31	Engineering Method and Data Collection	3
Feb 07	Data Displays: stem and leaf, boxplots, histogram, time plots	3
14	Review, [***Exam I***]	3
21	Modeling Random Behavior: Probability, Random Variables	3
28	Modeling Random Behavior: Discrete & Continuous	3
March 07	Estimation and Testing	3
14	Control Charts and Statistical Process Control (SPC)	3
21	***Spring Break March 21-25***	0
28	Linear Regression, Review, [***Exam II***]	3
April 04	Linear Regression	3
11	Full factorial and 2^k Factorial Experiments	3
18	Introduction to Response Surface Methodology	3
25	Review***, [Exam III***]	3
May2	*Final Exam* (optional make-up)	2

Prepared by Manuel Gomez, 01/21/2011