WEBER STATE UNIVERSITY
MANUFACTURING ENGINEERING TECHNOLOGY (MFET)
MFET 3810 COURSE OUTLINE

DEPARTMENT: Manufacturing and Mechanical Engineering Technology
COURSE NUMBER: MFET 3810
COURSE TITLE: Statistical Process Control and Reliability (this is a required course for MFET majors)
INSTRUCTOR: David Imig, B4-502D, Phone 626-8096. Office hours 9:30-10:20 AM MTWF
COURSE DESCRIPTION: (2009-2010) Weber State University Catalog
This is the second course in the Quality series for the MFET program designed to impart the six sigma body of knowledge. The course will focus on statistical techniques used in industrial process behavior charting, acceptance sampling, and reliability using MS Excel and Minitab software.
PREREQUISITES: MFET 2410
REQUIRED TEXTBOOK, WORKBOOK AND TOOLS:
Besterfield, Dale H., Quality Improvement Ninth Edition, Pearson/Prentice Hall, 2013 ISBN 978-0-13-500095-3262441-1
***Weiss, Neil, Introductory Statistics 8th Edition, Pearson/Addison Wesley, 2008, ISBN 0-321-39361-9**

COURSE LEARNING OUTCOMES & EXPECTED PERFORMANCE CRITERIA (ABET Criterion 3. Program Outcomes)

1. Provide students with an appropriate mastery of the knowledge, techniques, skills and modern tools of their discipline, specifically Provide students a broad understanding of SPC as well as a basic understanding of regression analysis and hypothesis testing (ABET Outcome a)
    a) Understand basic regression analysis and simple hypothesis testing.
    b) Know how to construct these charts; Xbar and R charts, Xbar and S charts, Individuals, Moving Average/Moving Range, Run charts, (p), (np), % nonconforming, (c), (u), and short run statistical control charts.
    c) Be able to calculate and interpret capability indices such as Cp and Cpk.
    d) Understand the differences in actions needed in inspection, quality control, statistical quality control, statistical process control, total quality management and continuous improvement.

    These outcomes will be assessed through exams, assignments

2. Provide students with the abilities to actively problem solve within a variety of environments (ABET Outcome b & f)
3. Provide Students with an ability to communicate effectively (ABET Outcome g)

    Outcomes b, f, and g will be demonstrated by participating as a team member in a capability study of a manufacturing process. Students will create and interpret appropriate charts and capability indices. The study will be presented to the class.

TOPICS COVERED:
Review of basic quality issues, descriptive statistics and distributions, regression analysis, control charts for variables, control charts for attributes, capability analysis, short production run charts, multivariate charts, acceptance sampling introduction, reliability introduction. Minitab statistical software will be used.

LAB/CLASS SCHEDULE:
50 minutes per day, 3 days per week

CONTRIBUTION OF COURSE TO MEETING CURRICULUM REQUIREMENTS (ABET CRITERION 5):
Students are prepared for a professional career and further study. Students are introduced to process capability analysis and reliability, both of which significantly impact design and manufacturing. Competence is determined through written assignments, quizzes, exams, papers

PREPARED BY: David Imig, Aug 23, 2012

and formal presentation of a semester project. This course prepares them for MFET 3910 and more advanced problem solving topics. The course also builds expertise in the use of MS Excel and Minitab as statistical problem solving tools.

Capstone or integrating experiences

A semester project is required that utilizes most of the topics covered in the class; students are required to write an engineering report and present a PowerPoint presentation.

RELATIONSHIP OF THIS COURSE TO PROGRAM OUTCOMES:

This course gives the student an understanding of the terms and concepts associated with statistical process control and reliability (ABET Outcomes a). At the conclusion of the course students should be able to effectively participate in industrial problem solving by statistically describing the behavior of a process (ABET Outcomes b, f). Students will also be able to professionally present process behavior data (ABET Outcome g).

GRADING CRITERIA:

Homework will be assigned at regular intervals (spot checked only). No late homework will be accepted without prior instructor approval; a 15% penalty per class period may apply. No late assignments will be accepted after the assignment in question has been graded and returned to students. All assignments are expected to display professionalism; up to 25% will be deducted for lack of professional appearance.

Students are required to perform a capability study on a machine or process in industry, and may work individually or in a team of three to five students. Students will summarize their findings in an **engineering report** as well as present their findings to the class.

There may be two exams and a comprehensive final. The exams will test comprehension of material covered in the assigned text and lectures. The exams will be closed book, multiple choice and short answer type exams. Although not on the schedule, quizzes may exist. They will be used as informal assessments, i.e., they will not harm your grade.

The contribution of homework and exams towards the final grade will be;

Assignments	10%	Exam 2	20%	Term Project	25%
Exam 1	20%	Final Exam	25%		

Letter grades for the course will be based on the following scale:

A	Overall Score $\geq$ 93	B	82 $\leq$ Overall Score < 86	C	72 $\leq$ Overall Score < 76
A-	90 $\leq$ Overall Score < 93	B-	79 $\leq$ Overall Score < 82	D	65 $\leq$ Overall Score < 72
B+	86 $\leq$ Overall Score < 90	C+	76 $\leq$ Overall Score < 79	E	65 $\leq$ Overall Score

Rights/Responsibilities - This syllabus is the governing document for this course; your decision to take this course amounts to tacit consent to the conditions of this syllabus. Please review the WSU Policies and Procedures Manual student code regarding ethics found at http://documents.weber.edu/ppm/6-22.htm, specifically section IV. Academic dishonesty, as described in the WSU Policies and Procedures Manual, will not be tolerated. Consequences may vary from grade adjustment to expulsion from the university.

Disabilities; Any student requiring accommodations or services due to a disability must contact Services for Students with Disabilities (SSD) in room 181 of the Student Service Center. SSD can also arrange to provide course materials (including this syllabus) in alternative formats.

Attendance; Attendance will not be graded, but absenteeism will adversely affect your grade through missed lectures and you will fail to receive assignments in a timely fashion. If you miss any class, it will be your responsibility to obtain relevant information from your fellow students.

Emergencies; If you find that during the semester you will not be able to turn in an assignment or take an exam on the date scheduled due to an illness or emergency, you must contact the professor before the date in question, if at all possible, or within 24 hours of the date at the latest.

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