STAT/INSY 5330/6330/6336 Course Syllabus

Course Title: Data Based Decision Making Using Six Sigma

Credit Hours: 3

Prerequisites: STAT 3610 or 3010 and INSY 4330 or equivalent


1. Course Objective / Relationship to professional component and outcomes:
The “Six Sigma” course is designed to provide students with an overview of Six Sigma, Lean Six Sigma, and Design for Six Sigma as well as give them the tools and training necessary to pass ASQ’s Green Belt Exam. Students will learn the background of Six Sigma, its applications in business, and why and how they will encounter Six Sigma after graduation.

The course covers the DMAIC elements of Six Sigma:
In the “Design” phase, students learn project definition and the roles of team members.
- The “Measure” phase covers process mapping, cause and effect tools, measurement system analysis, and capability analysis.
- For the “Analyze” phase, students review graphical techniques, FMEA’s, confidence intervals, and hypothesis testing as they relate to Six Sigma.
- In the “Improve” phase, students are introduced to correlation and regression and DOE, specifically using a “Statapult” example.
- In the “Control” phase, students are introduced to the concept of control, review SPC, and learn the relationship between these tools and the Six Sigma process improvement effort. Also covered in this phase are mistake proofing and project closure.

Course notes (to be completed in class) will be available each week on Web-CT. Throughout the entire course, examples from manufacturing and service businesses are used.

2. Attendance and Grading Policy:
There will be two tests and a comprehensive final exam. You will receive at least one week notice before exams. Permission for any make-up exam may be granted in case of a University approved excuse.
Grading Scale:
Grades will be weighted as follows:

For 5330: 
- Exam 1: 30%
- Exam 2: 30%
- Final Exam: 40%

For 6330/6336:
- Exam 1: 25%
- Exam 2: 25%
- Final Project: 20%
- Final Exam: 30%

Grades will be calculated using the above weights and a 10-point grading scale:
- 90 – 100 = A
- 80 – 89.99 = B
- 70 – 79.99 = C
- 60 – 69.99 = D
- < 60 = F

3. Special Accommodations for Students with Disabilities:
Students requiring special accommodations should make an appointment to discuss the accommodation memo during my office hours as soon as possible. If scheduled office hours conflict with classes, please arrange an alternate appointment time. If you do not have an accommodation memo, but need special accommodations, please contact the Program for Students with Disabilities, 1244 Haley Center, 334-844-5943 (Voice T/O).

4. Justification for Graduate Credit
Students learn advanced concepts in statistical analysis using statistical software, Minitab. They also must complete a Six Sigma project using the DMAIC Process and statistical analysis tools learned in class. This is a comprehensive project that is to be worked on throughout the semester and demonstrates a level of understanding beyond the basic applications in class and an ability to apply the tools properly in their work and/or research.
The following calendar is based on a semester schedule with a T/Th Class:

Day 1  Introductions
      Syllabus
      Ch 1 – Six Sigma Overview
Day 2  Ch 1 – Six Sigma Overview
      Project Definition
Day 3  Ch 2 – Goals & Metrics
Day 4  Ch 6 – Selecting and Tracking Projects
Day 5  Ch 3 – Creating Customer driven Organizations
Day 6  Ch 7 – Intro to DMAIC
Day 7  Ch 8 – Define Phase
Day 8  Ch 8 – Define Phase
Day 9  Case Study
Day 10 Exam 1
Day 11 Ch 10 – Measure
       ▪ Process Mapping
       ▪ Cause and Effect Tools
Day 12 Ch 10 – Measure
       ▪ Measurement Systems Analysis (Gage R&R)
Day 13 Ch 10 – Measure
       ▪ Capability Analysis
Day 14 Ch 11 – Analyze
       ▪ Knowledge Discovery
Day 15 Ch 12 – Analyze
       ▪ Graphical Techniques
       ▪ SPC
Day 16 Ch 12 – Analyze
       ▪ Process Capability
Day 17 Ch 13 – Analyze
       ▪ Process Capability
Day 18 Ch 13 – Analyze
       ▪ Process Capability
Day 19 Ch 14 – Analyze
       ▪ Stat Analysis of Cause and Effect
Day 20 Ch 14 – Analyze
       ▪ Stat Analysis of Cause and Effect
Day 21 Exam 2
Day 22 Ch 15 – Improve
       ▪ Managing Projects
Day 23 Ch 15 – Improve
       ▪ Managing Projects
Day 24 Ch 16 – Improve
       ▪ Risk Assessment
Day 25  Ch 16 – Improve
  ▪ Risk Assessment
Day 26  Ch 17 – Improve
  ▪ DOE
Day 27  Ch 17 – Improve
  ▪ DOE
Day 28  Ch 17 – Improve
  ▪ DOE
Day 29  Ch 18 – Control
Day 30  Ch 19 & 20 – Beyond DMAIC
Day 31  Final Exam
Special Considerations for COE Distance Education Courses

Methods of Delivery: The AU College of Engineering (COE), through its Graduate Outreach Program (GOP), offers selected graduate-level course work to off-campus students by various means, primarily streaming video delivered via the Internet or DVDs. Standard VHS video tape can also be produced. On-campus classes are held in specialized classrooms and are recorded each class day. Streaming video is available within a few minutes. DVDs (or tapes) are shipped the same day. Handout material made available to on-campus students is posted on the Internet or sent to off-campus students along with the tapes or DVDs.

Instructor/Student Communication: Typically, students and professors communicate via telephone and e-mail, and by exchanging documents via various means. Internet sites and discussion groups may be used to facilitate communication among the students as well as with the instructor.

Exam/Test Security: All off-campus students are required to have test proctors. These proctors serve on behalf of the instructors to maintain the integrity of the program. Proctors must be approved at the departmental level and by the Director of the GOP. Ideally, the proctor is someone in the human resources, personnel, or training and development section of the company, or agency, where the student is employed. On occasion, other personnel ranking at least one administrative level above the student serve as the proctor. In special cases, local librarians, or college testing services personnel may serve as the proctor. Responsibilities of proctors are clearly defined and, prior to approval, all proctors must agree to abide by rigorous rules related to the receipt, handling, administration, and return of tests and examinations.