

ESI 4221C: Industrial Quality Control
Spring 2012

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Office Hrs: Monday and Wednesday, 7th period (13:55 – 14:45)

Class Schedule: Monday 2nd period and Wednesday 1st and 2nd periods
Room: WEIM 1084
Req. Text: Introduction to Statistical Quality Control by D. C. Montgomery (6th Ed.)
 ISBN 978-0-470-16992-6

Course Materials: All course materials will be posted on the e-learning website for this course.
[\(https://elearning2.courses.ufl.edu/\)](https://elearning2.courses.ufl.edu/) Please check daily for announcements and supplemental course materials. It is your responsibility to ensure that you stay informed of any changes in due dates and/or exam schedules. Please print any handouts or lecture notes as you feel necessary.

Pre-requisite: STA 4321: Mathematical Statistics 1
Introduction to the theory of probability, counting rules, conditional probability, independence, additive and multiplicative laws, Bayes Rule. Discrete and continuous random variables, their distributions, moments and moment generating functions. Multivariate probability distributions, independence, covariance. Distributions of functions of random variables, sampling distributions, central limit theorem.

Co-requisite: STA 4322: Mathematical Statistics 2
Sampling distributions, central limit theorem, estimation, properties of point estimators, confidence intervals, hypothesis testing, common large sample tests, normal theory small sample tests, uniformly most powerful and likelihood ratio tests, linear models and least squares, correlation. Introduction to analysis of variance.

Grading:

Exam 1: (date and time TBA)	25%
Exam 2: (date and time TBA)	25%
Class Project (details TBA):	20%
Homework:	15%
Unannounced quizzes:	15%

Grading Policy:

		86.5 - 89.5	B +	76.5 - 79.5	C +	66.5 - 69.5	D +
92.5 - 100	A	82.5 - 86.5	B	72.5 - 76.5	C	62.5 - 66.5	D
89.5 - 92.5	A -	79.5 - 82.5	B -	69.5 - 72.5	C -	59.5 - 62.5	D -

Catalog Description:

- Factors affecting variation in product quality. The use of control charts to evaluate and control manufacturing processes. Techniques for acceptance and reliability testing. Laboratory exercises illustrate the operation and control of manufacturing processes and hazard function. Typical failure distributions, redundant systems, models of repair and maintenance.

Course Objective:

- To gain a solid understanding of the topics covered in this course with the intent to use the information in future courses or a career.

Course Outline:

- Quality Improvement in the Modern Business Environment (Ref: Chapter 1)
- The DMAIC Process (Ref: Chapter 2)
- Statistical Methods Useful in Quality Improvement (Ref: Chapter 3 and 4)
- Methods and Philosophy of Statistical Process Control (Ref: Chapter 5)
- Control Charts for Variables (Ref: Chapter 6)
- Control Charts for Attributes (Ref: Chapter 7)
- Process and Measurement System Capability Analysis (Ref: Chapter 8)
- Process Design and Improvements with Designed Experiments (Ref: Chapters 13 and 14)
- Acceptance Sampling (Ref: Chapter 15 and 16)

Classroom Attendance:

- Students are expected to attend all classes. There will be at least one weekly quiz in lieu of taking attendance. The quizzes are unannounced and there is no make-up. However, the lowest quiz grade will be excluded. The quiz will cover material from the most recent homework and topics covered in lecture.

Assignments and Exams:

- Homework will be posted typically on Thursday each week and will be due the following Wednesday at 7:25am. Solutions will be posted when the next homework is posted. I suggest starting the homework when it is posted. Hard copies of the homework may be submitted in class. Online submission is not acceptable. (Posting and due date is subject to change with the pace of the course.)
- All work must be shown for credit. A correct answer without proper work will not be given credit. When necessary, you must provide details of computations in Excel along with your homework.
- Unless specifically stated otherwise, students are free to discuss homework problems amongst themselves. However, each student is required to submit a homework paper that is representative of his or her own work, and is not a direct (or near direct) copy of another student's work. Students copying from others, or allowing others to copy from them will receive a zero for that assignment and may be subject to penalties put forth by the office of Student Judicial Affairs.
- There will be two exams in the course. These will be closed book and closed note exams. Any necessary formulas will be provided. The formula sheet will be posted prior to the exam. Exams are in-class.
- If there are grading errors on exam1 or homework, students have exactly one week to submit their exams or homework for re-grading after they have been returned. Afterward, exam and homework scores are considered final.

Classroom:

- Students are expected to act in a professional and mature manner in the classroom. Please set cell phones on silent before entering the classroom.

Honor Code:

- All students are expected to perform according to the University of Florida's Honor Code: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." On all work submitted for credit by students at the University of Florida, the following pledge is implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."
<http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php>

Other:

- The main job of the teaching assistant is to grade and help students with the course material.
- When seeking help from the teaching assistant or the course instructor, students are expected to have a list of well-formed questions, preferably written down on a piece of paper and, when appropriate, with references to specific pages of lecture notes or the textbooks.
- Students are expected to know the material covered in the prerequisite courses. When necessary, they are expected to relearn material from these courses on their own.

Accommodations:

- Students requesting accommodation for any aspect of this course must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student. The student should provide this documentation to the Instructor as early as possible in the semester, so that accommodations can be made.

UF Counseling Services:

- Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
 - University Counseling Center, 301 Peabody Hall, 392-1575
 - SHCC mental Health, Student Health Care Center, 392-1171
 - Career Resource Center, Reitz Union, 392-1601