

# ESI 4221C - Industrial Quality Control

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**Office:** Weil 202  
**Office Hours:** M 1pm-2.45pm

**Class Schedule:** MWF 2 (8:30am-9:20am)  
**Room:** Weil 270  
**Textbook (required):** Introduction to Statistical Quality Control by D. C. Montgomery (6th Ed.)

## Course 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.

## Co-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.

- 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

Midterm Exam	(30%) 2/18/2014 (at night)
Final Exam	(30%) 4/13/2014 (at night)
Class Project	(15%) Details TBA
Homework	(15%)
Quizzes	(10%)

**If you need a make up exam, please notify the instructor the earliest possible.**

## Grading Policy

Grading Policy

A	[93,100]
A-	[90,93)
B+	[87,90)
B	[83,87)
B-	[80,83)
C+	[77,80)
C	[73,77)
C-	[70,73)
D+	[67,70)
D	[63,67)
D-	[60,63)

**All grades will be posted on Sakai.**

## Course Outline

<b>Class 1</b>	1/7	Class Intro
<b>Class 2</b>	1/9	Intro to Quality
<b>Class 3</b>	1/12	No class
<b>Class 4</b>	1/14	DMAIC
<b>Class 5</b>	1/16	DMAIC
<b>Class 6</b>	1/19	No class
<b>Class 7</b>	1/21	DMAIC
<b>Class 8</b>	1/23	Modeling
<b>Class 9</b>	1/26	Modeling
<b>Class 10</b>	1/28	Modeling
<b>Class 11</b>	1/30	Inferences
<b>Class 12</b>	2/2	Inferences
<b>Class 13</b>	2/4	Inferences
<b>Class 14</b>	2/6	Methods and Philosophy
<b>Class 15</b>	2/9	Methods and Philosophy
<b>Class 16</b>	2/11	Methods and Philosophy
<b>Class 17</b>	2/13	Exam 1 Review
<b>Class 18</b>	2/16	No class
<b>Class 19</b>	2/18	Exam 1 (at night)
<b>Class 20</b>	2/20	Control Charts
<b>Class 21</b>	2/23	Control Charts

<b>Class 22</b>	2/25	Control Charts
<b>Class 23</b>	2/27	Control Charts
	3/3	Spring Break
	3/5	Spring Break
	3/7	Spring Break
<b>Class 24</b>	3/9	Control Charts
<b>Class 25</b>	3/11	Control Charts Review
<b>Class 26</b>	3/13	Capability Analysis
<b>Class 27</b>	3/16	Capability Analysis
<b>Class 28</b>	3/18	Capability Analysis
<b>Class 29</b>	3/20	Process Design Experiments
<b>Class 30</b>	3/23	Process Design Experiments
<b>Class 31</b>	3/25	Process Design Experiments
<b>Class 32</b>	3/27	Process Design Experiments
<b>Class 33</b>	3/30	Process Design Experiments
<b>Class 34</b>	4/1	Acceptance Sampling
<b>Class 35</b>	4/3	Acceptance Sampling
<b>Class 36</b>	4/6	Acceptance Sampling
<b>Class 37</b>	4/8	Exam 2 Review
<b>Class 38</b>	4/10	Exam 2 Review
<b>Class 39</b>	4/13	Exam 2 (at night)

## Classroom Attendance

Students are expected to attend all classes. There will be announced quizzes throughout the semester. No make up quiz will be given. However, for each student the lowest quiz grade will be excluded from the class grade calculations.

Attendance is not mandatory (except during the quiz dates), but is highly recommended. Apart from the quizzes, students will be expected to answer exam/quiz/homework questions on material viewed in class, on top of the lecture slides and the textbook.

## Assignments and Exams

- Homework will usually be due on Monday in the beginning of the lecture. Only hard copies (electronic or handwritten) will be accepted.
- You must show all your work in order to receive full credit. When needed, you might have to present your Excel spreadsheet calculations as well.
- Unless specifically stated, students should not collaborate on homework and project questions. If two or more papers seem to be directly related, the students involved will receive a 0.
- Late submissions will be accepted at most 2 days after the deadline. These papers will receive a 20% penalty.
- Both exams are closed book, closed notes. Formulas that are needed will be provided by the instructor in a formula sheet that will be posted on Sakai at least 3 days before the exam. Both exams are in class.
- Special office hours will be posted after a homework/project/exam is graded in order for students to be able to see their work. If you feel you have been graded unfairly, please make arrangements to visit the office hours.
- All regrade requests should be made at most one week after the grades are announced.

## Classroom Behavior

Students are expected to behave in a professional, cordial, and mature manner during lectures and office hours. Please refrain from using cell phones during the lectures.

## 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>

## Accommodation

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