Industrial Quality Control
ESI4221C (section # 2611)
Class Periods and Location: T 5, F 5-6, FLG 260
Academic Term: Spring 2018

Instructor:

Serdar Kirli, kirli@ise.ufl.edu, (352) 294-7703
Office Hours: Tuesdays and Thursdays from 1:30pm to 2:30pm or by appointment, Weil 302B

Teaching Assistants:

Farnaz Babaie Sarijaloo, Mondays and Thursdays from 10:00am to 11:30am, Weil 406
Kezhuo Zhou, Mondays from 2:00pm to 3:30pm, and Wednesdays from 10:00am to 11:30am, Weil 406

Course Description

Factors affecting variation in product quality; 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 (3 credits).

Course Pre-Requisites

STA4321 (Introduction to Probability) and STA4322 (Introduction to Statistics Theory) with minimum grades of C.

Course Objectives

This course provides an introduction to statistical techniques used in the design, control and improvement of quality in processes with observable output variation. The course includes an introduction to design of experiments and response surface methods.

Materials and Supply Fees

None

Professional Component (ABET):

This course supports the ISE undergraduate program educational objectives of producing graduates who
- "will be successful professionals in industrial and systems engineering or other disciplines",
- "can acquire advanced knowledge through continuing education or advanced degree programs"
- "can become active leaders in their profession and/or community"

Relation to Program Outcomes (ABET):

Outcome	Coverage*
a. Apply knowledge	Low
b. Design and conduct experiments; analyze data	High
c. Design a system, component or process	
d. Function on teams	Medium
e. Solve problems	Medium
f. Professional and ethical responsibility	Low
g. Communicate	Low
h. Impact of engineering solutions	Low
i. Lifelong learning	
j. Contemporary issues	
k. Techniques, skills, and tools for degree program	High

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not part of the course.

Required Textbooks and Software

- "Introduction to Statistical Quality Control," Wiley (2012) 7th Edition D. Montgomery
  ISBN : 978-1-118-14681-1
- Lecture notes and examples (posted online)
- RStudio (a free and open-source integrated development environment (IDE) for R, which is a programming language for statistical computing and graphics)

Course Schedule

Week	Topic	Chapter
1	Introduction & DMAIC process	1,2
2	Modeling Process Quality	3
3	Inferences about Product Quality	4
4	Inferences about Product Quality	4
5	**Exam-1** & Statistical Process Control	**5**
6	Control Charts for Variables	6
7	Control Charts for Variables & Attributes	6,7
8	Control Charts for Attributes & **Exam-2**	7
9	------ Spring Break ------	
10	Process Capability Analysis	8
11	Process Capability Analysis & Factorial Experiments for Process Design	8,13
12	Factorial Experiments for Process Design	13
13	Acceptance Sampling	15
14	**Exam-3** & Project Work	
15	Project Work	
16	Project Work	

Attendance Policy and Class Expectations

Attendance is not required; however, it is strongly recommended. It will be to your benefit to attend all lectures. Students will be responsible for all material covered in class.

Lectures are there to facilitate efficient learning, not chatting with friends, surfing the net, reading the Alligator, or sleeping. You should be focused on the course material and the in-class exercises assigned, not on activities that do not involve course work. Those who behave inappropriately will be asked to leave. If you cannot follow the lecture anymore, you can leave the class quietly; I will not be offended. Please, remember to turn off your cell phone as soon as you enter the classroom.

Make-Up Policy

Excused absences require appropriate documentation.

If you missed an exam due to a health problem, you will need to provide documentation that indicates the date of the visit. A note indicating that you were seen at the health center the day of the exam is not sufficient documentation of a medically excused absence from an exam. The note must say that you were medically unable to take the exam.

In case of an exam conflict, you will need to present evidence of the conflict to the instructor.

Employment interviews, employer events, weddings, vacations, etc. are not excused absences.

Grading Policy

Exam-1	25%
Exam-2	25%
Exam-3	25%
Team project	25%

Your grade will be based on three in-class exams and a team project, each constituting 25% of your final grade.

In each exam, I will include a few challenging tasks, which only the best students will be able to answer. These are the questions that distinguish the A students.

Exam grade disputes must be made to the instructor <u>within one week</u> after grades are posted. Any grade dispute after the specified period will not be considered.

Project teams will consist of 4-5 students. At the end of the semester, you will evaluate your teammates and you will be evaluated by them. Your grade will be based not only on your team score but also on your teammates' evaluations of you.

Grade Scale

Grade	Range	Grade Points
A	[93-100]	4.00
A-	[90-93)	3.67
B+	[87-90)	3.33
B	[83-87)	3.00
B-	[80-83)	2.67
C+	[77-80)	2.33
C	[73-77)	2.00
C-	[70-73)	1.67
D+	[65-70)	1.33
D	[60-65)	1.00
D-	[55-60)	0.67

There may or may not be a curve at the end of the semester. This depends on the overall performance of the class throughout the semester.

Please keep in mind that this is a challenging and time consuming class, and the percentage of As has historically been in the 10% range. You have to study hard and perform well in every class activity in order to deserve an A.

Please note that **this is a required course for ISE students. This means that you must earn, at a minimum, a C in order to satisfy the requirement.**

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu/evals. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments.
For more information, please see: http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html

Campus Resources:

Health and Wellness

> **U Matter, We Care:**
> If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.
>
> **Counseling and Wellness Center:** http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
>
> **Sexual Assault Recovery Services (SARS)**
> Student Health Care Center, 392-1161.
>
> **University Police Department** at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

> **E-learning technical support**, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.
>
> **Career Resource Center**, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.
>
> **Library Support**, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.
>
> **Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.
>
> **Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.
>
> **Student Complaints Campus**: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.
>
> **On-Line Students Complaints**: http://www.distance.ufl.edu/student-complaint-process.