

Industrial Quality Control

ESI 4221C - Section 2611

Class Periods: T,F | Period 5 (11:45 AM - 12:35 PM)

F | Period 6 (12:50 PM - 1:40 PM)

Location: FLG 0260

Academic Term: Spring 2017

Instructor:

Dr. Konstantinos Gakis

kgakis@ufl.edu

352-294-7719

Office Hours: Tuesdays 2-4pm & Fridays 2-4pm. All office hours will be taking place at Weil 406. Changes or additional office hours will be announced as needed to assist students with assignments and tests.

Teaching Assistants:

Please contact through the Canvas website:

- Kezhuo Zhou, <zhoukezhuo@ufl.edu>

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.

Course Pre-Requisites / Co-Requisites

STA 4321 and STA 4322 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.

Professional Component (ABET):

This is a course with strong engineering analysis and statistical content. Throughout the semester, students will complete a project expected to meet specific criteria demonstrating an understanding of practical problems through the eyes of an industrial engineer. Assignments in the beginning of the semester reinforce their statistical analysis skills. Furthermore the project helps students cultivate project management and planning skills as part of their professional development.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
a. Apply knowledge	Low
b1. Conduct experiments	
b2. Statistical design of experiments	High
c. Design	
d. Function on teams	Low
e. Solve problems	Medium
f. Professional and ethical responsibility	Medium
g. Communicate	Low
h1. Economic impact	Low
h2. Global, societal, and environmental impact	
i. Lifelong learning	

j. Contemporary issues	
k. Techniques, skills, and tools for degree program	High

Required Textbooks and Software

- "Introduction to Statistical Quality Control," Wiley (2012) 7th Edition
- D. Montgomery
- ISBN : 978-1-118-32416-5 (digital version)
- ISBN : 978-1-118-14681-1 (printed version)
- Lecture notes and examples (posted online)
- Software: MS Excel, preferably 2010 or later version

Course Schedule

Week No.	From:	To:	General Calendar	Lesson
1	2-Jan-17	6-Jan-17		Course Overview. Review of Probability
2	9-Jan-17	13-Jan-17		Review of Statistical Inference.
3	16-Jan-17	20-Jan-17		Control Charts for Variables.
4	23-Jan-17	27-Jan-17		Control Charts for Attributes.
5	30-Jan-17	3-Feb-17		Moving Average Control Charts. Cumulative Sum Control Charts.
6	6-Feb-17	10-Feb-17		Multivariate Process Monitoring.
7	13-Feb-17	17-Feb-17		Review of Linear Regression. Design of Experiments.
8	20-Feb-17	24-Feb-17		Review. Exam 1.
9	27-Feb-17	3-Mar-17		Acceptance Sampling. Sampling Inspection by Attributes.
10	6-Mar-17	10-Mar-17	Spring Break	
11	13-Mar-17	17-Mar-17		Sampling Inspection by Variables.
12	20-Mar-17	24-Mar-17		Review. Exam 2.
13	27-Mar-17	31-Mar-17		Project assignment.
14	3-Apr-17	7-Apr-17	F: last day to drop	Project discussion.
15	10-Apr-17	14-Apr-17		Project discussion.
16	17-Apr-17	21-Apr-17	Reading Days R-F	Project discussion.
17	24-Apr-17	28-Apr-17	Week of Finals	Project submission.

Indicative Homework Assignment Plan

- 1) General statistical inference
- 2) Process control & control charts

- 3) Moving average & cumulative sum
- 4) Regression & experiments
- 5) Acceptance sampling

Attendance Policy, Class Expectations, and Make-Up Policy

Class Material and Announcements

Lecture notes, assignments, practice exercises, examples and extra information are all going to be available to you on the class website at CANVAS. The assignment submission system can be reached at the tab Assignments.

Grade Adjustments/Curving

Curving/grade adjustments may be made depending jointly on two factors: max score and score median being less than A- and C- respectively. CANVAS automatic grade curving will be used.

Re-grading Policy

Students may request regrading within 10 days after their grades are made available. A request from students to have their exams, assignments or projects regarded, may result in loss of points.

Attendance

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Attendance is not mandatory. However, it is your responsibility to keep up with the class updates (material to be taught, homework, exams, etc.). You will be responsible for everything covered in class even if it is not in the textbook. Attending students will be asked to participate in class exercises. Attendance may be taken in class, but only for statistical reasons. Attendance records will not affect your class grade.

Lectures are there to facilitate efficient learning. Students that behave inappropriately will be asked to leave. If you feel like you cannot follow the lecture anymore, you can leave the classroom quietly; I will not be offended. Please remember to turn off your cell phones as soon as you enter the classroom.

Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

Exam Policy

Under no circumstances students should expect an arrangement that will not require their physical presence to an examination.

Students needing a makeup exam, or special accommodation have to inform the instructor at least one week before the date of the exam. Please do not ask for a make-up exam to attend a job interview. Exceptions will be made for medical emergencies or other extraordinary occasions.

Homework Assignments and online Quizzes

Any homework assignments or online Quizzes must be submitted via the Course's website in the specified system unless specified otherwise. Submission of links to outside or cloud files does not constitute submission.

Assignment deadlines are rigid. If you do not submit before the deadline or submit the wrong file, you may receive a zero. Only the instructor has the authority to grant late submissions.

Project Guidelines

Each student will work a project individually. Students are expected to be present and participate in project meetings. Failure to attend most of these meetings may reflect in project grades. Project development will take place in stages.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets (5) (four best will count)	100 each	25%
Midterm Exam 1	100	25%
Midterm Exam 2	100	25%
Project	100	25%
		100%

Grading Policy

Percent	Grade	Grade Points
93.0 - 100	A	4.00
90.0 - 92.9	A-	3.67
87.0 - 89.9	B+	3.33
83.0 - 86.9	B	3.00
80.0 - 82.9	B-	2.67
77.0 - 79.9	C+	2.33
73.0 - 76.9	C	2.00
70.0 - 72.9	C-	1.67
67.0 - 69.9	D+	1.33
63.0 - 66.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

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>.