

Industrial Quality Control
ESI4221C Section 19C7
MWF, Periods 2, 8:30 AM - 9:20 AM
Location: LIT 0201
Academic Term: Fall 2022

Instructor:

Sima Sabahi

Email: sima.sabahi@ufl.edu

Office Phone Number: (352) 273-1896

Virtual Office Hours: Mondays, 11:00 am-1:00 pm, or by appointment

TAs:

Can Baris Olcer

Email: canbarisolcer@ufl.edu

Jake Rogalsky

Email: jrogalsky@ufl.edu

Virtual Office Hour: Wednesdays, 12:00 pm – 1:00 pm or by appointment

Course Description

This course is about the use of modern statistical methods for quality control and improvement. It provides comprehensive coverage of the subject from basic principles to state-of-the-art concepts and applications. This course will give students a sound understanding of the principles and the basis for applying them in a variety of situations. (3 credits).

Course Pre-Requisites / Co-Requisites

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

Course Objectives

At the end of this course, students will be able to:

- Apply both traditional and cutting-edge statistical quality control methods
- Learn appropriate statistical technique selection in real-world situations
- Implement process characterization and optimization experiments
- Apply fundamental techniques using real-world research and data

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*
1. Ability to identify, formulate and solve engineering problems by applying principles of engineering, science, and mathematics	Medium
2. Ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare as well as global, cultural, social, environmental, and economic factors	Low
3. Ability to communicate effectively with a range of audiences	Low
4. Ability to recognize ethical and professional responsibilities in engineering situations and	Low

make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
5. Ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives	Low
6. Ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	High
7. Ability to acquire and apply new knowledge as needed, using appropriate learning strategies	

*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

- Title: Introduction to Statistical Quality Control
 - Author: Douglas C. Montgomery
 - Date and Edition: 2012 7th Edition
 - ISBN: 978-1-118-14681-1
- RStudio

Tentative Course Schedule:

This is a tentative outline. The instructor reserves the right to make changes as she sees necessary.

Week	Chapter	Topics	Assignments
1	1 & 2	Introduction and DMAIC	Ch1&2 HW
2,3	3	Modeling Process Quality	Ch3 HW
4,5	4	Inferences about Product Quality	Ch4 HW
6	-	Exam 1 on 9/29 (Evening Exam)	
6,7	5,6	Control Charts for Variables	Ch6 HW
8	7	Control Charts for Attributes	Ch7 HW
9	8	Process Capability Analysis	Ch8 HW
10,11	13	Factorial Experiments for Process Design	Ch13 HW, Case study proposal
12,13	15	Acceptance Sampling	Ch15 HW
13	-	Exam 2 on 11/17 (Evening Exam)	
14,15,16	-	Case Study presentations	Case Study peer assessment

Attendance Policy

Attendance is not required; however, it is strongly recommended. Students will be responsible for all material covered in class. There may be bonus credit for class participation. Class participation includes attendance and participation in in-class activities.

Make-Up Policy

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

Your grade will be based on two evening exams, several homework assignments, case study presentation, and case study peer assessment. All assignments must be submitted via Canvas unless specified otherwise. Homework solutions will be posted right after the due date.

Assignment	Percentage of Final Grade
Homework	30%
Exam 1	25%
Exam 2	25%
Case Study	20%
Total	100%

Assignments

Homework (30%): There will be 7-8 homework assignments throughout the semester. The material will be drawn from the notebooks and exercises thought during the class. Homework must be submitted by the due date and there will be a penalty for late homework submissions (30% penalty). Homework assignments submitted 24 hours after the deadline will not be accepted. There are no make-ups provided if you missed homework unless you have a severe illness.

Exams (50%): There will be two in-person exams. Exam 2 will not be cumulative. If you miss any exam due to a justified emergency, you must contact the instructor immediately within 24 hours for scheduling a make-up exam. Make-up exams will be given for unanticipated and emergency absences with appropriate documentation NOT for a job interview or leisure trips. Exam grade disputes must be made to the instructor within one week after grades are posted. Any grade dispute after the specified period will not be considered. The following describes the procedure:

- (1) Within one week after your grade has been posted, e-mail the teaching assistant requesting a grade breakdown,
- (2) Compare your solution to the solution posted on the website using the detailed grade breakdown you receive,
- (3) If you still have questions about your grade, to resolve the issue either meet the instructor during office hours or request an appointment.

Case Study (20%): The case study team will consist of 3 students. Each team will complete a case study analysis on one paper published in reputable journals. Example journals include ISE Transactions, ASQ, etc. You will create your group and submit a short proposal. Each team must have one unique case study; therefore, I will identify if there are two teams with the same studies and conflicts will be solved on a first come – first serve basis. The one-page case study proposal should identify:

1. Team members
2. Paper that your team has selected (with PDF of the paper attached)
3. Reason/motivation for selecting that case study
4. Course topics that the case studies use and how the studies are related

Case study presentations should be 10-15 minutes and should include:

1. Definition of the problem that is interesting to the team and why is it important
2. Analysis of the model/approach presented in the papers
3. Summary and critique of the contributions and shortages in the paper
4. Suggestions for future contributions/improvements

At the end of the semester, each student will evaluate his/her teammates. Your case study grade will be based on instructor's, graders' and your teammates' evaluations of your work.

Grade Scale

Range	Grade	Grade Points
93.0 - 100.0	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

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. You must 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 who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-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.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

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: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

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 Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

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://care.dso.ufl.edu>.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.