

STAT/BUS 127 — Introduction to Quality Improvements

Winter 2023

Instructor:

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TA:

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Course Description

Explores Deming's 14 points for management, graphical methods, fishbone diagram, Pareto analysis, control charts for attributes and variables, cusum and moving average charts, process-capability. Also covers economic design, acceptance sampling, Taguchi method, parameter design, tolerance design, reliability, hazard rate, censoring, and accelerated life testing.

Course Information

- **Course Times:**

- Lecture
 - * 001: MWF 2-2:50pm in HMNSS 1501
- Discussion
 - * 021: F 10-10:50am in OLM 1411
 - * 022: F 11-11:50am in OLM 1411
 - * 023: F 12-12:50pm in OLM 1411
 - * 024: F 1-1:50pm in OLM 1411

- **Textbook:** Course Lecture Notes (by Dr. Linda Penas, provided on Canvas)

- **Material Covered:** Chapters 1-10, Appendices, and Handouts

- **Course Website:** Canvas/eLearn

- **Software:** Excel, PollEverywhere, R (if time permits)

- **Prerequisites:** STAT 008 or STAT 010

Grading Breakdown

Lecture/Discussion Attendance	10%
Discussion Worksheets	15%
Homework	25%
Exam #1	20%
Exam #2	30%

Cumulative numerical averages of 90-100 are guaranteed at least an A-, 80-89 at least a B-, and 70-79 at least a C-. The exact ranges for letter grades will ultimately be determined after Exam #2.

Lectures

Lectures will consist of slides, group activities, and exercises. Though attendance is not mandatory for all lectures, random attendance checks will be done throughout the quarter. It is imperative that you try to attend as many lectures as possible to get a better understanding of the material!

For some of the group activities and exercises, PollEverywhere will be used. The PollEverywhere information is the following:

- Link: pollev.com/stat127

Discussions (15%)

Discussion sections will consist of completing Excel lab worksheets, review sessions, and Q&A. The Excel labs are designed to help familiarize yourself with Excel while applying what you learned from lecture through real-world problems. For most sections, you will work on lab worksheets with your fellow classmates and have the opportunity to ask your TA questions regarding the lab worksheets and homework.

- Lab worksheets will become available on Canvas every Friday at 8am PT (unless otherwise noted).
- You have until Friday at 11:59pm PT to complete and turn in your lab worksheet on Canvas/Gradescope.
- Points will be given based on completion and accuracy.
- Your lowest lab grade will be dropped from the final grade calculations.

Random attendance checks will also be done during discussion sections throughout the quarter.

Attendance (10%)

Random attendance checks will be administered in both lecture and discussion (8 and 4 times respectively). To get full points for attendance, you need to be present for at least 10 attendance checks. Attending office hours for either Monika or Jericho can also make up for any attendance

checks you missed, up to a maximum 4 visits. As such, the 10 attendance checks can come from the following:

	# of Opportunities
Lecture	8
Discussion	4
Office Hours	4

As such, being present for 10 out of the 12 lecture and discussion attendance checks will give you full credit for attendance.

Homework (25%)

Homework will be assigned on a regular basis with specific due dates. These assignments will consist of mini-projects, statistical problems, and Excel tasks.

- Homework will become available on Canvas/Gradescope at least one week from the due date.
- Complete and turn in your homework on Canvas/Gradescope.
 - Make sure all submissions are in a .pdf or .docx format. If you do hand-write solutions, please use Adobe Scan or CamScanner to take photos of your work and upload them to Canvas/Gradescope in a .pdf format.
 - Failure to submit in one of those two formats will result in point deductions.
 - Supplemental materials (e.g. Excel worksheets) may also be required to be turned in as well, depending on the assignment. Please refer to the first page of each homework assignment to determine if supplemental materials need to be turned in.
- Points will be given based on completion and accuracy.
- All homeworks will count toward your grade.

Late Work for Lab Worksheets and Homework Assignments

A late day can be used on any lab worksheet or homework assignment, no questions asked. However, you are allotted five late days and you can only use one late day maximum on an assignment.

If you use up all of your allotted late days or are over a day late turning in an assignment (unless there is a extenuating circumstance), the following deductions will occur:

- 0-24 hours late: half credit
- Over 24 hours late: no credit

If there are extenuating circumstances preventing you from completing the assignment in a timely fashion, please email Jericho (jlaws011@ucr.edu) about your circumstance.

Exams (50%)

There will be two in-class exams. Exam #1 will tentatively cover chapters 1-5 in the lecture notes, while Exam #2 will be a cumulative exam, with most of the focus on chapters 6-10.

- Exam #1 (20%): Monday, 2/13 from 2-2:50pm in HMNSS 1501
- Exam #2 (30%): Friday, 3/17 from 2-2:50pm in HMNSS 1501, with a group take-home component due Monday, 3/20 at 9pm

Exam #1 and the in-person component of Exam #2 will be closed book. You will be allowed to have one 8.5×11 inch sheet of paper. Tables will be provided with the exam.

The group take-home component of Exam #2 will be open book, open note, open discussion. You will be able to work in groups of size 1-3 on the group take-home component. More details will come as the end of the quarter approaches.

- No make-up exams will be given unless extenuating circumstances exist. The instructor must be notified within 24 hours of the scheduled exam time or a score of 0 will be recorded.
- No sharing of information will be allowed during in-person exams. Any sharing of materials will result in a grade of 0 for all involved parties!

More information will be coming later.

Computer Software

Excel and PollEverywhere are required for this class. We will be using these applications to aid our learning of quality improvement. R may be used at the end of the quarter, if time permits.

Instructions to access Excel can be found in the Homework #0 and Lab #1 assignments.

Instructions to access PollEverywhere can be found in Homework #0. It is important that you are able to access these applications by the end of the first week.

Extra Credit

Occasional extra credit opportunities will appear throughout the quarter in lectures, lab worksheets, homework assignments, and exams. Though these opportunities are present, keep in mind that these chances will cumulatively bump your overall grade between 2-5%.

Cheating

No sharing of books, notes, tables, calculators will be allowed during in-person components of exams! Any exchange of information during exams will result in a score of 0 for **ALL** involved persons.

Per the UCR General Catalog, cheating pertains, but is not limited, to the following:

- copying from another student's examination, quiz, laboratory work, or homework assignment,

- using pre-prepared notes or other resources, in any form, during an examination, unless such use is expressly authorized by the instructor,
- knowingly allowing someone else to copy from his or her homework, laboratory work, or examination,
- revising work after its final evaluation and representing the revised version as being the original work,
- forging or otherwise unauthorized changing of an earned grade,
- when one student arranges for another student to take an examination using the first student's identification (both parties are liable), and
- unauthorized acquisition of an examination prior to the exam date.
- **Cell phones are not allowed for use during exams!**

Course Outline

Week	Dates	Topics	Chapters
1	1/9-1/13	Introduction to Quality Improvement Descriptive Statistical Methods	1, 2.1, 2.2
2	1/16-1/20	1/16: No Class (Holiday) Statistical Distributions Sampling Distribution	2.3, 2.4, 3.1
3	1/23-1/27	Inferential Statistical Methods Statistical Process Control	3.2-3.5, 4.1
4	1/30-2/3	Statistical Process Control Control Charts for Variables	4, 5.1
5	2/6-2/10	Control Charts for Variables Review for Exam #1	5
6	2/13-2/17	2/13: Exam #1 (in class) Control Charts for Attributes	6
7	2/20-2/24	2/20: No Class (Holiday) Test for Randomness Pareto Analysis	6.4, 7
8	2/27-3/3	Acceptance Sampling	8
9	3/6-3/10	Experimental Design for Process Control	9
10	3/13-3/17	ANOVA Gage R & R Review for Exam #1 3/17: Exam #2 (in-class portion)	10
Finals	3/20-3/24	3/20, 9pm: Exam #2 (take-home portion due)	

- Note that the topics covered are tentatively scheduled and may be altered slightly as the quarter progresses.