New Jersey Institute of Technology IE 672: Industrial Quality Control

TEXT: Montgomery, Douglas C. Introduction to Statistical Quality Control 8th edition, Wiley, 2020.

Week	Торіс	Homework
1	Introduction to Quality Control Chapter 1-3: History, basic quality tools	HW: 3-5, 3-7, 3-9, 3- 11
2	Probability Chapter 3: Probability, Probability Distributions, Expectation	HW: 3-23, 3-25, 3-26, 3-29, 3-30, 3-31, 3-37, 3-50, 3-53
3	Statistical Inference Chapter 4: Basic Statistics, Estimation, Hypothesis Tests, Confidence Intervals, Tests for Normality	HW: 4-1, 4-2, 4-3, 4- 6, 4-11, 4-15, 4-18, 4- 19, 4-25
4	Intro to control charts Chapter 5: History / Theory, Rational Subgrouping, Graphical Techniques,	HW: 5-15, 5-16, 5-17, 5-18, 5-19, 5-26
5	Variables Control Charts; Chapter 6: X bar and R Charts, X bar and S Charts, Individuals and Moving Range Charts, ARL	HW: 6-8, 6-9, 6-23, 6- 35, 6-41, 6-44, 6-56
6	Attributes Control Charts; Chapter 7: p Chart, np Chart, C Chart, U Chart	HW: 7-19, 7-20, 7-25, 7-34 7-35, 7-41, 7-63
7	Other Control Chart Techniques Chapter 9: CUSUM, EWMA, Autocorrelated processes	HW: 9-1, 9-3, 9-10, 9- 11, 10-4, 10-6
8	Mid Term Exam	
9	Process and Measurement System Capability Analysis Chapter 8: Process Capability indices, Tolerance Analysis, Measurement Systems Analysis, Gage R&R	HW: 8-5, 8-13, 8-15, 8-19, 8-20, 8-22, 8-28, 8-29, 8-30, 8-45, 8-47, 8-49
10	Acceptance Sampling Chapter 15 Advantages & disadvantages, Attributes / OC Curves, Sampling Errors, AQL & LTPD	HW: 15-1, 15-2, 15-5, 15-9, 15-13
11	Acceptance Sampling Continued Chapter 15 & 16: Double, Multiple, Sequential, Standards (ANSI, Dodge Romig), Variables Sampling	HW: 15-16, 15-17, 15- 18, 15-19,16-1, 16-3, 16-4, 16-5, 16-6
12	Off line Quality Chapter 4, 13,: Introduction to DOE, ANOVA, One way Classification, Fixed and Random Effects Modes, Multiple Comparisons	HW: 4-21, 4-23, 4-25, 13-1, 13-3, 13-4, 13-5, 13-6
13	Design of Experiments Chapter 13, 14: Factorial and Fractional Factorial Designs, Response Surface Designs, Notes on Categorical Data, Sample sizes	HW: 13-9, 13-10, 13- 11, 13-12, 13-16, 13- 17, 14-6
14	Quality Assurance Methods Quality Auditing, Risk Assessment Techniques (FMEA, FTA)	HW: CQA and CQE study guides Student Projects due
15	Final Exam	

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Course Format Details:

Student Expectations:

- 1. **Canvas:** The class meets on Canvas <u>https://canvas.njit.edu/</u>. You must check in on the site regularly to review any updates, new materials, and discussion.
- 2. **'Attend' Lectures:** Each student is responsible for reviewing the weekly lectures. At a minimum you must review the Powerpoint presentations posted on Canvas. We supplement the lectures by instead adding brief topic reviews on specific materials as needed. These recordings will be added to the Canvas site as 'Lessons'
- 3. **Complete Homework.** Homework is assigned each week with the lecture. You are expected to hand in HW by posting it to me at the appropriate assignment location on Canvas. Homework is collected every other week in order to maintain some flexibility as a distance learning class.
- 4. **Class Participation:** You are expected to participate in class by posting in the discussion boards. I encourage students to post questions related to solving the HW problems. Also I expect students to answer other students HW questions in order to get credit for participation.
- 5. Lecture Reviews: I will periodically hold a live review meeting where I go through recent materials or homework questions. Attendance at the live session is optional; however, when possible I will record these sessions and you should at least review the recordings on your own time.
- 6. **Exams:** Exams will be held twice per semester. Formatting of exams will be part on-line and part 'in-class'. More detail will be provided on this as the course progresses.
- 7. **Class Projects:** Each student must complete a project consisting f review of a topic agreed on by me. The project consists of a short paper and a presentation to the class. More details will be provided.

Instructor Availability:

Weekly office hours will be held remotely. Generally these are Sunday evenings with other times scheduled periodically or at specific times by appointment. Students are free to contact me by phone or email during this time to go through any questions. I may choose to hold these on Webex depending on student demand and availability.

Grade Distributions:

Exams: 65% (approximately 30% Midterm, 35% Final) Homework 10% Participation 10% Project 15%