IENG 316 **Industrial Quality Control** Spring 2020

Text: Montgomery, Douglas C., Introduction to Statistical Quality Control, John Wiley and Sons, 7th Edition, 2012

Instructor: Dr. Majid Jaridi (Majid.Jaridi@mail.wvu.edu)
Room 341 ESB. Phone (304) 293-4099
Office Hours: 10:00 – 12:00 TR, or by appointment

Catalog Description

Principles and methods for controlling the quality of manufactured products, with emphasis on both economic and statistical aspects of product acceptance and process control.

Course Objectives and Philosophy

This course is designed to teach students modern statistical methods for quality control and improvement. The objective is to give the students a sound understanding of the principles and the basis for applying them in a variety of both product and non-product situations. Although statistical techniques are emphasized, the course has a strong engineering and management orientation. The students will gain a comprehensive knowledge of the state of the art techniques in statistical process control (SPC).

Prerequisite

Engineering Statistics (IENG-213) or equivalent.

Student Learning Objectives

Upon completing the course, students will:

- Possess comprehensive knowledge of SPC techniques.
- Have an introductory knowledge of total quality management methods.
- Be able to develop and analyze solution strategies for quality-related problems using SPC.

Course Contribution to Professional Component
Engineering Science - 33 %, Engineering Design - 67 %

Course Relationship to Program Educational Outcomes

The course relates to the following program educational outcome:
Outcome 1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
Outcome 6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Key abilities:

- Process control
- Quality control sampling

Performance Indicators:

- Experience to decide which process control procedure to apply in a specific situation (Outcome 1)
- Knowledge to decide where to focus resources to enhance quality and to minimize waste (Outcome 1).
- Students will be able to decide which process control procedure to apply in a specific situation. (Outcome 1)
- Knowledge to decide whether to use a sampling plan or perform 100% inspection (Outcome 6)
- Experience to select the most appropriate sampling inspection procedure and ensure that it is executed properly (Outcome 6)

Course Schedule (Note: This schedule is tentative and flexible)

Week	Topic	Reading
1	Introduction Review of Basic Statistics	Ch. 1 Ch. 3
2	Inferences about Process Quality	Ch. 4
3	Methods of SPC Control Charts for Variables	Ch. 5 Ch. 6
4	Control Charts for Variables	Ch. 6
5	Control Charts for Variables	Ch. 6
6	TEST I Control Charts for Attributes	 Ch. 7
7	Control Charts for Attributes	Ch. 7
8	Control Charts for Attributes	Ch. 7
9	Process Capability Analysis CUSUM and EWMA Charts	Ch. 8 Ch. 9
10	Other Process Monitoring Techniques Economic Design of Control Charts	Ch. 10

11	TEST II Lot-by-Lot Acceptance Sampling for Attributes	Ch. 15
12	Lot-by-Lot Acceptance Sampling for Attributes	Ch. 15
13	Lot-by-Lot Acceptance Sampling for Variables	Ch. 16
14	Lot-by-Lot Acceptance Sampling for Variables	Ch. 16
15	Advanced Topics	TBA

General Policies

1. Homework will be assigned each week. Late homework will not be accepted.
2. Tests will be closed book and closed notes. One standard size A4 sheet of paper will be permitted for students to reference. Additional reference material will be supplied as needed.
3. Makeup tests and incomplete grades are not given except as allowed by University policy.
4. Group work is encouraged on homework. It is very important that all members of the group participate and understand the solution to every problem assigned.
5. Class attendance is highly encouraged. In the case of absence from a class, it is the student's responsibility to get the notes from a fellow student.
6. Cell phones and all other communication devices must be turned off during class.

Final Exam: Friday, May 8th, 11:00 a.m. to 1:00 p.m.

Grading Policy

Test 1	30%
Test 2	30%
Homework	10%
Unannounced Quizzes	10%
Final Test	20%
	100%

Tentative Basis for Issuing Final Grades

	>	90%	:	A
80%	--	89%	:	B
70%	--	79%	:	C
60%	--	69%	:	D
	<	59%	:	F