Department of: Statistics

College of: Administration and Economics.

University of: Salahaddin-Hawler.

Subject: Quality Control.

Course Book : *Master*

Second Semester

Lecturer's name: Dr. Bekhal S. Sedeeq

Academic Year: 2023 - 2024

Course Book

1. Course name	Quality Control
2. Lecturer in charge	Dr. Bekhal S. Sedeeq
3. Department/ College	Department of Statistics and Information / College of Administration and Economics.
4. Contact	e-mail: Bikhal.sedeeq@su.edu.krd
5. Time (in hours) per week	For example Theory: 2 hours Practical: 1
6. Office hours	3 hours per week
7. Course code	
8. Teacher's academic profile Dr. Bekhal S. Sedeeq	I got a BSc degree from Salahaddin University-Erbil in 1998 in the College of Administration & Economics Statistics department. I earned a master's degree in applied Statistics in 2002 and started as an assistant lecturer in the Statistics department. I got a PhD degree from Salahaddin University-Erbil in 2008 in College of Administration & Economics Statistics department, and I finished my PhD degree in Reliability. I have been teaching in the Statistics department at Salahaddin University since 2002. I have taught (Principles of Statistics, Reliability, Differential Equations, and Decision Theory to undergraduate students). I supervised the research of four students in an MSc degree and during periods of teaching, I supervised the research of a graduate student's fourth stage.
9. Keywords	Introduction to Quality Control, Definition of Quality Control, Some Statistical Distribution, Control Charts, Warning Limits & Objectives of Control Charts, In Order to Establish Control Chart, State of Control (Process in Control), Process out of Control & Analysis of out of Control, Types of Control Charts/ Variables Control Charts/ $\overline{X}$ - Chart, Moving Average Chart, Moving Range Chart,…

10. Course overview:

The basic objectives of quality control are to maintain quality standards to ensure customer satisfaction and reduce the costs associated with the scrapping of defective goods. Quality control has two different aspects:

Quality of design is related to the appropriateness of the product for the customer's purpose. After establishing customer requirements or the customer's insight of quality it is personified in production design and requirement. Quality of conformance is related to the extent to which the goods that are

produced conform to the conditions laid down. This aspect of quality concerns the steadiness of the product.

Quality control involves the use of resources in the inspection process. To this has to be added the costs of prevention (special investigation into failure, personnel training, and maintenance) which have to be balanced against the cost of failure (scrap, reworking, sorting rejects, loss of sales, after-sales service, serving complaints,

Additional operations)

However, quality control costs can be reduced by the inspection of variables in the production process.

11. Course objective:

This course is divided into two parts. The first part includes Quality Control; the basic objectives of quality control are to maintain quality standards in order to ensure customer satisfaction and to reduce the costs associated with the scrapping of defective goods. Quality control has two different aspects:

Quality of design is related to the appropriateness of the product for the customer's purpose. After establishing customer requirements or the customer's insight of quality it is personified in production design and requirement. Quality of conformance is related to the extent to which the goods that are produced conform to the conditions laid down. This aspect of quality concerns the steadiness of the product.

Quality control involves the use of resources in the inspection process. To this has to be added the costs of prevention (special investigation into failure, personnel training, and maintenance) which have to be balanced against the cost of failure (scrap, reworking, sorting rejects, loss of sales, after-sales service, serving complaints,

Additional operations)

However, quality control costs can be reduced by the inspection of variables in the production process. These include the raw materials that go into the production

while Part II provides the reliability, The objectives of Reliability are To explain how system reliability can be measured and how reliability growth models can be used for reliability prediction, To describe safety arguments and how these are used, To discuss the problems of safety assurance, and To introduce safety cases and how these are used in safety validation.

12. Student's obligation

A student has an obligation to exhibit honesty and to respect the ethical standards of the profession in carrying out his or her academic assignments. Without limiting the application of this principle, a student may be found to have violated this obligation if he or she: (see note concerning more appropriate invocation of University of Pittsburgh Student Code of Conduct and Judicial Procedures)

1. Refers during an academic evaluation to materials or sources, or employs devices, not authorized by the faculty member.
2. Provides assistance during an academic evaluation to another person in a manner not authorized by the faculty member.
3. Receives assistance during an academic evaluation from another person in a manner not authorized by the faculty member.
4. Engages in unauthorized possession, buying, selling, obtaining, or use of any materials intended to be used as an instrument of academic evaluation in advance of its administration.
5. Acts as a substitute for another person in any academic evaluation process.
6. Utilizes a substitute in any academic evaluation proceeding.
7. Practices any form of deceit in an academic evaluation proceeding.
8. Depends on the aid of others in a manner expressly prohibited by the faculty member, in the research,

preparation, creation, writing, performing, or publication of work to be submitted for academic credit or evaluation.
9. Provides aid to another person, knowing such aid is expressly prohibited by the instructor, in the research, preparation, creation, writing, performing, or publication of work to be submitted for academic credit or evaluation.
10. Presents as one's own, for academic evaluation, the ideas, representations, or words of another person or persons without customary and proper acknowledgment of sources.

13. Forms of teaching

Different forms of teaching will be used to reach the objectives of the course: PowerPoint presentations for the head titles and summary of conclusion, classification of material, and any other illustrations. There will be classroom discussions and the lecture will give enough background to translate, solve, and analyze.

14. Assessment scheme

The student must be examined in 20.

Putting grades for daily activities, and homework, for (5) marks.

Review article in 25

The annual work of the material (50) marks.

The final exam is out of (50) marks.

The grades of the annual work and the final exam will be out of (100) marks and the student will be successful if he gets (60) or more.)

15. Student learning outcome:

Student learning outcomes statements clearly state the expected knowledge, skills, attitudes, competencies, and habits of mind that students are expected to acquire at an institution of higher education. Transparent student learning outcomes statements are:

- Specific to the institutional level and/or program level
- Clearly expressed and understandable by multiple audiences
- Prominently posted at or linked to multiple places across the website
- Updated regularly to reflect current outcomes
- Receptive to feedback or comments on the quality and utility of the information provided

16. Course Reading List and References:

1. Besterfield, D.H. (1979): Quality Control. Prentice-Hall Inc. New York, U.S.A.
2. Besterfield, D.H. (2004): Quality Control. 7thEdition, Prentice-Hall Inc. New York, U.S.A.
3. Douglas, C. Montgomery. (2005): Introduction to Statistical Quality Control.
4. Grant, E. L. & Leavenworth, R. S. (1988): Statistical Quality Control. 6thEdition, McGraw- Hill Book Company. New York, U.S.A.
5. Juran, J. M. (1974): Quality Control Handbook. 3 edition, McGraw-Hill Book Company. New York, U.S.A.
6. Robertson, A. G. (1971): Quality Control and Reliability. 8 edition, Pitman Press, Bath. London, U.K.
7. David, J. Smith. (1972): Reliability Engineering

17. The Topics:

Lecturer's name: Dr.Bekhal Samad

	Subject
First week	Part One/ Introduction to Quality Control

	➢ Some Definitions of Quality Control	Four hours a week
Second week	➢ Some Statistical Distribution ➢ Control Charts	
Third week	➢ Warning Limits & Objectives of Control Charts	
Fourth week	➢ In Order to Establish Control Chart	
Fifth week	➢ State of Control (Process in Control)	
Sixth week	➢ Process out of Control & Analysis of out of Control	
Seventh week	Exam 1 in (10 Dgree)	
Eighth week	➢ Types of Control Charts/ Variables Control Charts/ ➢ $\overline{X}$ - Chart	
Ninth week	➢ R - Chart	
Tenth week	➢ S - Chart	
Eleventh week	➢ Attribute Control Charts/ ➢ p - Chart	
Twelfth week	➢ c - Chart	
Thirteenth week	➢ Examples of Quality Control	
Fourteenth week	Exam 2 in (30 Dgree)	
Fifteenth week		

18. Practical Topics (If there is any)

In this section, The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date, and time of the lecture.

19. Examinations:

1. Write the Control Charts Errors.
2. Write the steps for the Construction of Quality Control Chart.
3. Why Use a Control Chart?

SO: To monitor, control, and improve process performance over time by studying variation and its source.

4. 15 random observations of cigarettes were taken and the percentage of nicotine was :

$x_i = 18, 16, 20, 19, 18, 19, 18, 18, 17, 17.3, 18.6, 20.3, 21, 19.7, 16.4$

5. The family of Attribute Charts includes the:
   SO: (p-Chart, np-Chart, c-Chart, u-Chart).
6. Charts may measure:
   1. Percent defective (p-chart)
   2. Number of defects (c-chart)

20. Extra notes:

21. Peer review پێداچوونەوەی هاوەڵ