INTER AMERICAN UNIVERSITY OF PUERTO RICO
METROPOLITAN CAMPUS
BUSINESS FACULTY
GRADUATE DEPARTMENT

SYLLABUS

I. GENERAL INFORMATION

COURSE TITLE	:	Quality Management & Control
CODE AND NUMBER	:	BADM 6140
CREDITS	:	Three (3)
ACADEMIC TERM	:	
PROFESSOR	:	
OFFICE LOCATION AND HOURS		:
OFFICE TELEPHONE	:	
E-MAIL	:	

II. DESCRIPTION

Analysis of quality management in companies as a competitive strategy. Use of techniques of evaluation and quality control.

III. OBJECTIVES

It is expected that upon completing the course, the student should be able to:

After successfully completing the course, students should be able to do the following:

1. Understand the philosophy and basic concepts of quality improvement.
2. Describe the DMAIC process (define, measure, analyze, improve, and control).
3. Should be able to use the methods of statistical process control.
4. Should be able to design, use, and interpret control charts for variables.
5. Should be able to design, use, and interpret control charts for attributes.
6. Should be able to perform analysis of process capability and measurement system capability.
7. Should be able to design, use, and interpret exponentially weighted moving average and moving average control charts.
8. Should be able to use the Seven Quality Tools in both a manufacturing and service setting.
9. Should understand the differences between inspecting quality versus building in quality.
10. Should understand the importance of process variation control and its effects in product and service quality.
11. Should have a basic understanding of the Taguchi method

IV. CONTENT

Part I: Philosophy and Fundamentals

1 Introduction to Quality Control and the Total Quality System

1.1 Evolution of Quality Control

1.2 Quality and Quality Control Definition

1.3 Quality Assurance

1.4 Quality Circles and Quality Improvement Teams

1.5 Customer Needs and Market Share

1.6 Benefits of Quality Control and the Total Quality System

1.7 Quality and Reliability

1.8 Quality Improvement

1.9 Product and Service Costing

1-10 Quality Costs

1-11 Measuring Quality Costs

1-12 Management of Quality

1-13 Quality and Productivity

1-14 Total Quality Environmental Management

2 Some Philosophies and Their Impact on Quality 47

2.1 Service Industries and Their Characteristics

2.2 Model for Service Quality

2.3 W. Edwards Deming's Philosophy

2.4 Philip B. Crosby's Philosophy

2.5 Joseph M. Juran's Philosophy

2.6 The Three Philosophies Compared

3 Quality Management: Practices, Tools, and Standards

3.1 Management Practices

3.2 An overview of Quality Function Deployment

3.3 Benchmarking and Performance Evaluation

3.5 Continuous Quality Improvement versus Business Process Re-engineering

3.6 International Standards ISO 9000 and Other Derivatives

First Partial Examination

Part II: Statistical Foundations and Methods of Quality Improvement

4 Fundamentals of Statistical Concepts and Techniques in Quality Control and Improvement

4.1 Introduction and Chapter

4.2 Population and Sample

4.3 Parameter and Statistic

4.4 Probability

4.5 Descriptive Statistics: Describing Product or Process Characteristics

4.6 Probability Distributions

4.7 Inferential Statistics: Drawing Conclusions on Product and Process Quality

5 Data Analyses and Sampling 229

5.1 Introduction

5.2 Empirical Distribution Plots

5.3 Randomness of a Sequence

5.4 Validating Distributional Assumptions

5.5 Transformations to Achieve Normality

5.6 Analysis of Count Data

5.7 Analysis of Customer Satisfaction Data

5.8 Concepts in Sampling

Part III: Statistical Process Control

6 Statistical Process Control Using Control Charts

6.1 Introduction

6.2 Causes of Variation

6.3 Statistical Basis for Control Charts

6.4 Selection of Rational Samples

6.5 Analysis of Patterns in Control Charts

6.6 Maintenance of Control Charts

7 Control Charts for Variables

7.1 Introduction

7.2 Selection of Characteristics for Investigation

7.3 Preliminary Decisions

7.4 Control Charts for the Mean and Range

7.5 Control Charts for the Mean and Standard Deviation

7.6 Control Charts for Individual Units

7.7 Control Charts for Short Production Runs

7.8 Other Control Charts

7.9 Risk-Adjusted Control Charts

7.10 Multivariate Control Charts

8 Control Charts for Attributes

8.1 Introduction and Chapter Objectives

8.2 Advantages and Disadvantages of Attribute Charts

8.3 Preliminary Decisions

8.4 Chart for Proportion Nonconforming: p-Chart

8.5 Chart for Number of Nonconforming Items: np-Chart

8.6 Chart for Number of Nonconformities: c-Chart

8.7 Chart for Number of Nonconformities Per Unit: u-Chart

8.8 Chart for Demerits Per Unit: u-Chart

8.9 Charts for Highly Conforming Processes

8.10 Operating Characteristic Curves for Attribute Control Charts

Second Partial Examination

9 Process Capability Analysis

9.1 Introduction

9.2 Specification Limits and Control Limits

9.3 Process Capability Analysis

9.4 Natural Tolerance Limits

9.5 Specifications and Process Capability

9.6 Process Capability Indices

9.7 Process Capability Analysis Procedures

9.8 Capability Analysis for Nonnormal Distributions

9.9 Setting Tolerances on Assemblies and Components

9.10 Estimating Statistical Tolerance Limits of a Process

Part IV: Acceptance Sampling

10 Acceptance Sampling Plans for Attributes and Variables

10.1 Introduction

10.2 Advantages and Disadvantages of Sampling

10.3 Producer and Consumer Risks

10.4 Operating Characteristic Curve

10.5 Types of Sampling Plans

10.6 Evaluating Sampling Plans

10.7 Bayes Rule and Decision Making Based on Samples

10.8 Lot-by-Lot Attribute Sampling Plans

10.9 Other Attribute Sampling Plans

10.10 Deming's kp Rule

10.11 Sampling Plans for Variables

10.12 Variable Sampling Plans for a Process Parameter

10.13 Variable Sampling Plans for Estimating the Lot Proportion Nonconforming

Part V: Product and Process Design

11 Reliability

11.1 Introduction

11.2 Reliability

11.3 Life-Cycle Curve and Probability Distributions in Modeling Reliability

11.4 System Reliability

11.5 Operating Characteristic Curves

11.6 Reliability and Life Testing Plans

11.7 Survival Analysis

12 Experimental Design and the Taguchi Method

12.1 Introduction and Chapter Objectives

12.2 Experimental Design Fundamentals

12.3 Some Experimental Designs

12.4 Factorial Experiments

12.5 The Taguchi Method

12.6 The Taguchi Philosophy

12.7 Loss Functions

12.8 Signal-to-Noise Ratio and Performance Measures

12.9 Critique of S/N Ratios

12.10 Experimental Design in the Taguchi Method

12.11 Parameter Design in the Taguchi Method

12.12 Critique of Experimental Design and the Taguchi Method

Final Examination

V. LEARNING ACTIVITIES

A. Lectures
B. Case Studies

C. Supplementary readings
D. Internet searches
E. Audiovisual Support: Powerpoint presentations, videos
F. Presentation and discussion of relevant academic journal or trade journal articles

VI. EVALUATION

Required activities to achieve course objective should include various pedagogical activities such as, homework, presentations, short quizzes, partial examinations, and interactive participation. It is highly recommended the utilization of the Blackboard platform as a support system for the course. Assessment techniques should be applied at professor discretion.

1. Students are expected to review prerequisite material as needed, and to read assignments and complete written exercises prior to the class session.

2. Students are required to actively participate in class discussions.

3. The student will be required to complete case studies and homework problems as a mean to practice the acquired practical knowledge in the classroom.

4. This course requires intense practice of quantitative exercises presented in class. Therefore, it is important that students complete al assigned text exercises and case analysis before coming to the classroom. This is a way of acquiring practical knowledge in the classroom.

5. The exercises require the use of Excel or equivalent analytics as a way of better solving the assigned problems. Furthermore, it provides the student a way to situational analysis in a closer way to those used around production and operations.

6. Due to the nature of the intense mathematical practice attendance to class is mandatory with a higher evaluation weight at the end of the course.

Recommended Evaluation:

2 Partial Examinations	(40%)
1 Final Examination	(20%)
Homework / Cases	(30%)
Attendance & Participation	(10%)
Total	(100%)

VII. SPECIAL NOTES

A. Auxiliary services or special needs

ALL STUDENTS WHO REQUIRE AUXILIARY SERVICES OR SPECIAL ASSISTANCE MUST REQUEST THEM AT THE BEGINNING OF THE COURSE OR AS SOON AS THEY BECOME AWARE THAT THEY NEED THEM, THROUGH THE CORRESPONDING REGISTRY, IN THE OFFICE OF THE COORDINATOR OF SERVICES FOR STUDENTS WITH DISABILITIES, DR. MARÍA DE LOS ÁNGELES CABELLO. SHE IS LOCATED IN THE COUNSELING AND COUNSELING PROGRAM, OFFICE 111, ON THE FIRST FLOOR OF THE JOHN WILL HARRIS BUILDING, EXTENSION 2306

B. Honesty, fraud, and plagiarism

DISHONESTY, FRAUD, PLAGIARISM AND ANY OTHER INAPPROPRIATE BEHAVIOR IN RELATION TO ACADEMIC WORK CONSTITUTES MAJOR INFRACTIONS SANCTIONED BY THE GENERAL STUDENT REGULATIONS. THE MAJOR INFRACTIONS, AS STATED IN THE GENERAL STUDENT REGULATIONS, MAY HAVE AS A CONSEQUENCE, SUSPENSION FROM THE UNIVERSITY FOR A DEFINITE PERIOD GREATER THAN ONE YEAR OR THE PERMANENT EXPULSION FROM THE UNIVERSITY, AMONG OTHER SANCTIONS.

C. Use of electronic devices

CELLULAR TELEPHONES AND ANY OTHER ELECTRONIC DEVICE THAT COULD INTERRUPT THE TEACHING AND LEARNING PROCESSES OR ALTER THE ENVIRONMENT LEADING TO ACADEMIC EXCELLENCE WILL BE DEACTIVATED. ANY URGENT SITUATION WILL BE DEALT WITH, AS APPROPRIATE. THE HANDLING OF ELECTRONIC DEVICES THAT ALLOW STUDENTS TO ACCESS, STORE OR SEND DATA DURING EVALUATIONS OR EXAMINATIONS IS PROHIBITED

D. Compliance with the Provisions of Title IX

THE FEDERAL HIGHER EDUCATION ACT, AS AMENDED, PROHIBITS DISCRIMINATION BECAUSE OF SEX IN ANY ACADEMIC, EDUCATIONAL, EXTRACURRICULAR, AND ATHLETIC ACTIVITY OR IN ANY OTHER PROGRAM OR FUNCTION, SPONSORED OR CONTROLLED BY A HIGHER EDUCATION INSTITUTION, WHETHER OR NOT IT IS CONDUCTED WITHIN OR OUTSIDE THE PROPERTY OF THE INSTITUTION, IF THE INSTITUTION RECEIVES FEDERAL FUNDS.

IN HARMONY WITH THE CURRENT FEDERAL REGULATION, IN OUR ACADEMIC UNIT AN ASSISTANT COORDINATOR OF TITLE IX HAS BEEN DESIGNATED TO OFFER ASSISTANCE AND ORIENTATION IN RELATION TO ANY ALLEGED INCIDENT CONSTITUTING DISCRIMINATION BECAUSE OF SEX OR GENDER,

SEXUAL HARASSMENT OR SEXUAL AGGRESSION. THE ASSISTANT COORDINATOR SR. GEORGE RIVERA CAN BE REACHED BY PHONE AT EXTENSION 2262 O 2147, OR BY E-MAIL GRIVERAR@METRO.INTER.EDU.

THE NORMATIVE DOCUMENT TITLED **NORMS AND PROCEDURES TO DEAL WITH ALLEGED VIOLATIONS OF THE PROVISIONS OF TITLE IX** IS THE DOCUMENT THAT CONTAINS THE INSTITUTIONAL RULES TO DIRECT ANY COMPLAINT THAT APPEARS TO BE THIS TYPE OF ALLEGATION. THIS DOCUMENT IS AVAILABLE IN THE WEB SITE OF INTER AMERICAN UNIVERSITY OF PUERTO RICO (WWW.INTER.EDU).

VIII. EDUCATIONAL RESOURCES

a) Required Textbook (Classic)

Mitra, Amitava (2016). ***Fundamentals of Quality Control and Improvement***, 4th Edition. New Jersey: John Wiley and Sons. ISBN: 978-1-118-70514-8

b) Audiovisual and Information Technology

Campus On-line Services at - http://cai.inter.edu/

- **Use of CIT Open Lab is encouraged for use of Spreadsheets and other support software such as SPSS.**
- **ProQuest**
- **Infotrac (Database)**
  - Business and Company Resource Center
  - General Business File International
  - Expanded Academic ASAP

IX. BIBLIOGRAPHY (OR REFERENCES)

Brechner, E. (2015). ***Agile Project Management with Kanban***. New York: Pearson Prentice Hall.

Liker, Jeffrey K. (2004). ***The Toyota Way***. New York: McGraw Hill.

Meredith,J.R., Mantel, S.J., Shafer, S.M. & Sutton, M.M. (2014). ***Project Management in Practice***. (5th. Ed.) New York: John Wiley and Sons.

Montgomery D.C. (2013). ***Introduction to Statistical Quality Control*** (7th ed.). New Jersey: John Wiley & Sons

Motwani, Jaideep & Otero-González, Luis A. (mayo, 2001). "La reingeniería en la empresa y tecnología informática como uno de sus elementos fundamentales." ***Forum Empresarial***, (6)1: 71-88.

Powell, Stephen G. & Baker, Kenneth R. (2014). ***Management Science: The Art of Modeling with Spreadsheets***. (4th. Ed.*)*. New York: John Wiley and Sons.

Reid, R. Dan & Sanders, Nada R. (2016). ***Operations Management and Integrated Approach***. (6th. Ed.) New York: John Wiley and Sons.

Render, B., Stair R.M., Hanna, M.E. & Hale, T.S. (2015). ***Quantitative Analysis for Management***, (12th. Ed.). New York: Pearson Prentice Hall

Shiba, Shoji, Graham, Alan & Walden, David (1993). ***A new American TQM: Four practical revolutions in management.*** Portland: Productivity Press

Taguchi, Genichi (1986). ***Introduction to Quality Engineering: Designing quality into products and processes.*** Dearborn, Mi.: American Supplier Institute.

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